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ABSTRACT

A collection of articles by behavioral scientists and users of behavioral science covering the problem of utilization is presented in this volume. Articles include "Applied Social Research: Some Conditions Affecting Its Utilization" by Charles Y. Glock; "Two Case Studies of Utilization of the Behavioral Sciences" by Ronald Lippitt; "Case Studies on the Utilization of Behavioral Science Research" by John C. Flanagan; "The Application of Social Research Findings" by Elmo C. Wilson; "The Occupational Research Program: An Example of Research Utilization" by Carroll L. Shartle; "The Communication and Utilization of the Results of Agricultural Research by American Farmers: A Case History, 1900-1950" by M. L. Wilson; "Some Principles Regarding the Utilization of Social Science Research within the Military" by George W. Croker; and "Research Utilization" by Howard E. Page. (SP)

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FOREWORD

For several years the Institute for Communication Research, with the aid and encouragement of the Ford Foundation, has concerned itself with some of the problems of bringing behavioral science research into use.

The usefulness of scientific knowledge depends, of course, both upon the quality of the science and upon the relation between scientist and user. Behavioral science is young; it has not yet had time to build the foundation of theory on which some branches of natural science rest; it has not yet developed such middle men and appliers as natural science has in physicians and engineers. If behavioral science were simply further advanced, then, it would be more widely useful.

But behavioral science, even in its young state, is much less useful than it could be. Its findings come too slowly to public knowledge and application. It should be able to build on the experience of natural science, and avoid some of the mistakes and omissions that once beclouded the relationship of natural science with its users. In other words, it should do better with utilization than it does.

This is the area to which we have directed our attention. We have stimulated a number of behavioral scientists and users of behavioral science to set down on paper their experiences with and thoughts about the problem of utilization. We have made and caused to be made several theoretical studies of the relationship. We have also made a few empirical studies -- among them, an exploration of the level and distribution of behavioral science knowledge in the general public; a study of the utilization of research reported at the annual conference of a learned society; a study of the diffusion of a research report; a study of the coming into use of a new theoretical concept; and several studies of the process of diffusing behavioral science knowledge to non-scientists. For two years one of our staff observed in an applied research organization the process and problems of relationship between scientist and client. We have also worked a bit with the problem of analyzing and mapping the behavioral problems of a given field.

Some of these papers and results have been published in journals and books; others will be. The number of requests for copies of such unpublished papers as we have mimeographed has been remarkable. Therefore, we are making some of these products available in inexpensive published form. There will be several of these booklets, the length of the series depending partly on the demand.

This first booklet contains some of the memoranda which were written for us by scholars and research administrators who had been in the best position to observe and think about the problems of bringing behavioral science into use. All these papers are based on case experience. Represented in the following papers are five distinguished producers of behavioral research -- Dr. Charles Y. Glock, formerly director of the Bureau of Applied Social Research at Columbia, presently director of the Survey Research Center at the University of California in Berkeley; Dr. Ronald Lippitt, of the Center for Group Dynamics at the University of Michigan; Dr. John C. Flanagan, director of American Institute for Research, of Pittsburgh; Dr. Elmo C. Wilson, president of International Research Associates; and Dr. Carroll L. Shartle, director of leadership studies at the Ohio State University. The following three papers are by important users of behavioral science research. M. L. Wilson's account of the rise of scientific agriculture in this country is an important chapter of history as well as a series of stimulating thoughts on the utilization of research. Colonel Croker, who was formerly administrative officer of the Human Resources Research Institute of the Air Force, and Dr. Page, who was for a number of years in charge of the psychological research program of the Office of Naval Research, write about the problems of dealing with research scientists and their contracts and reports.

We are greatly indebted to the Ford Foundation for making these studies possible. To Dr. Bernard Berelson, now director of the Bureau of Applied Social Research at Columbia, who, as head of the Behavioral Science Program of the Ford Foundation, first started us on this line of activity, we owe a special debt of gratitude, which we should like to recognize by dedicating this series of publications to him.

Wilbur Schramm
Director

Institute for Communication Research
October, 1961

APPLIED SOCIAL RESEARCH: Some Conditions Affecting Its Utilization

By Charles Y. Glock

The director of the Survey Research Center at the University of California in Berkeley here addresses himself to the question: what can be learned from the experience to date about the conditions which make for maximum utilization of the results of social research? Before he came to Berkeley Dr. Glock was director of the Bureau of Applied Social Research at Columbia University.

INTRODUCTION

The development of the social sciences and particularly of social research has stimulated an increasing interest to use the new knowledge and techniques to help solve everyday problems. Social research, by now, has been adapted to the social engineering problems of such diverse institutions as churches and schools, voluntary health associations and radio stations, business corporations and labor unions, governments and lobbies, and so on.

This trend has stirred considerable controversy. Concern has been expressed about the possible misuse of social research and the danger that its development enables those groups in society who hold the most power to wield even greater power. Such a view assumes applied social research already to have achieved a certain amount of success. There are some, however, who suggest that the accumulated experience with applied social research has been, all things considered, a failure. Such critics claim that the results of an appreciable amount of the research which has been done are, for the most part, gathering dust on library shelves and office files, having never been used nor even read in many cases.

Observations of these kinds have stimulated some interest in trying to discover just what the situation really is. Just who are the organizations sponsoring and using applied social research, to what purposes, and what are the results both for these organizations and the general community? Such questions inevitably lead to a still more general question. What can be learned from the experience to date about the conditions which make for maximum utilization of the results of social research? The present paper attempts a partial answer to this latter question.

The social sciences are brought to bear on applied problems in perhaps two general ways. On the one hand, practitioners trained in the social sciences undoubtedly use their knowledge in making everyday decisions, in planning programs, and the like. How much this occurs and with what success is, of course, very difficult to decide. Furthermore, very little attention has been given to trying to find out. The more manifest attempts to use applied social research are more familiar and widely discussed. An organization faced with a problem which it cannot solve out of its own experience and knowledge commissions a research investigation to find an answer. It may elect to conduct the investigation itself, or go outside and commission a specialized research group to make the study. Whatever it does, the decision to order research can be perceived as a utilization decision. There is a commitment to the idea that social research can be useful. However, the confirmation of this idea, i.e., the actual utilization of research, arises only after the investigation has been completed. With the results of the study in hand, what then is done with them?

It is difficult to know just where to start in trying to identify the conditions under which maximum utilization of social research occurs. It is undoubtedly of interest to know what influences various types of actual and potential clients to commission or not to commission research. It is also of interest to know what determines whether or not the results of such research are in fact used and in what way. Unfortunately, the evidence necessary to answer the first question adequately has still to be accumulated. However, enough is known to attempt an answer to the second one. This is what the present paper attempts to do, seeking, in effect, to distill from the available evidence some of the principles which determine whether or not applied social research, once commissioned and executed, is used.*

The utilization of the results of social research is influenced by a wide variety of factors having to do with the nature of the problem, certain characteristics of the client and of the research organization, the relationship which is formed between them, and the way that the research is executed. It is proposed to deal with each of these factors in turn, beginning with a discussion of how the nature of the problem influences the ultimate utilization of applied social research.

1. THE NATURE OF THE PROGRAM

As has been said, there is an implicit acknowledgment that social research can be useful when a client or sponsor** elects to commission a study and when the research organization accepts that commission. However, the skills of social research are clearly more amenable to the solution of certain kinds of problems than others. The commissioning of a piece of research, therefore, does not guarantee the utilization of its findings. Viewed from the perspective of practical utilization, what kinds of problems can be most effectively handled by applied social research?

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* The evidence is drawn both from the experience of the Bureau of Applied Social Research, Columbia University, and from the case studies of other research organizations known to the author. This experience encompasses applied social research conducted on behalf of such diverse organizations as business and industrial firms, labor unions, social welfare agencies, departments of the federal government and of municipal and state governments, and trade associations. The case examples have been disguised and in some cases otherwise altered to emphasize a particular point.

** The words client and sponsor will be used interchangeably to connote the organization commissioning research.

Needless to say, the less complex the problem, the greater the possibility that research conducted to solve it will be used. Similarly, it is apparent that social research can ordinarily contribute more to solving a problem having to do with an immediate decision facing a sponsor than one having more long-term implications. However, holding constant such gross differences in the characteristics of problems, what more can be said about how the nature of the problem is related to utilization? The discussion which follows focuses on some of the factors considered to be most influential in determining the character of this relationship.

a. Functional Requirements of the Problem

Research is most often commissioned to serve one or more of three functions: to evaluate, to diagnose, or to prescribe. An evaluative function is served where research measures the degree of success achieved in reaching a stated objective. For example, how many people behaved in a certain way as a result of their exposure to a propaganda campaign? The diagnostic function is served where research succeeds in accounting for a given situation. For example, why have the public's attitudes toward big business deteriorated? What accounts for the fact that some people suffering from venereal disease never seek treatment? Where the function is purely prescriptive, it can be presumed that some diagnosis has already been made and the need is to know how best to proceed. For example, should a client act in one way or another in a given situation? It is not uncommon to find problems which ask that research perform all three of these functions. For example, how successful is a campaign to improve the public's attitudes toward the United Nations? (Evaluative) What accounts for the degree of success achieved? (Diagnostic) What can be done to achieve even greater success? (Prescriptive)

At its present stage of development, it is undoubtedly true that social research is more capable of answering evaluative questions than diagnostic ones, that it can deal more effectively with diagnostic questions than prescriptive ones. Prescription ordinarily involves prediction and this is likely to pose the most difficult problems in research design. However, the needs of clients with respect to having these functions performed seem just the reverse of the ability of research to serve them. Though he may state his problem in evaluative or diagnostic terms, the client's underlying motivation for commissioning research is usually prescriptive. He wants to know what he should do.

As a consequence of all this, it turns out that even the best research on an evaluative problem is likely to be less useful to a sponsor than relatively inadequate research on a prescriptive problem, with research on diagnostic problems falling somewhere in between in terms of utility. This distinction is illustrated in the following examples.

Research is not often commissioned to serve only an evaluative purpose. Ordinarily, the sponsor requests a diagnosis as well, in the way he states his problem. If he does not, the research organization is likely to include it as a requirement nevertheless. However, there are examples of purely evaluative studies on record which may be cited for illustrative purposes. Here is a typical one which turned out to have relatively little utility. The client, in this case the trade association for a large industry, annually operates a national promotional campaign designed to make the public feel more favorably toward that industry. Having conducted this campaign over a number of years, the trade association, stimulated by pressure from its member companies, decided to have the campaign evaluated. A research study was commissioned to determine what effect, if any, the campaign was having on the public's attitudes toward the industry. The study showed that the campaign was mildly effective and certainly was not harmful to the industry's interests.

The results of the study, however, posed the following questions for the sponsor. Was the improvement achieved sufficient to warrant the expenditure involved? What accounted for the fact that the campaign was not more successful? What might be done to improve its effectiveness? None of these questions were answered by the research study itself. A decision was finally made to continue the campaign on the same basis it had been conducted in the past. The research obviously contributed to this decision, but this was the extent of its utility.

Where the problem is posed in diagnostic terms, it is likely, as has been suggested above, to lead to greater utilization. A case in point is a study sponsored by the public health division of a state government. The sponsor was concerned that persons suffering from venereal disease often failed to volunteer for treatment. The study, which involved a comparison of a matched group of volunteers and non-volunteers, disclosed, among other things, that the volunteers were more likely to have pronounced symptoms of the disorder than the non-volunteers, were more likely to be informed of the meaning of these symptoms, and were less disturbed over the social stigma attached to contracting the disease.

In this case, the study performed its diagnostic function adequately. The sponsor was made more acutely aware of the obstacles to be overcome. However, the study provided no clear directives as to how to proceed. Its utility, therefore, lay in narrowing the range of alternative modes of action without, however, specifying which of them was likely to be most effective.

Where research is asked to perform a _purely_ prescriptive function, the problem is likely to be a trivial one or very narrow in scope. The reason for this is that, for the most part, purely prescriptive problems can be posed only where the diagnostic need can be met without recourse to research. In such cases, however, as the following example illustrates, the research is likely to be highly useful to the client. The client, a meat packer, had decided to extend his operations to include the manufacture and distribution of soap products. One of the policies to be decided was whether or not to associate prominently the corporate name of the meat packing division with the new line of soap products. It seemed reasonable to suppose that by doing so the line of soap products would inherit the good will of the well-known and respected name of the meat packing division. At the same time, however, it was conceived that such a decision might boomerang if consumers should negatively connect the fat content of soap with meat. A research organization was asked to design a study which would provide a basis for a more objective decision between the two alternatives. The results of the study clearly supported a decision to avoid associating the two lines of products with the single corporate name and the sponsor acted accordingly. In this instance, utilization of the research was maximized because the implications for action were central to its design.

It is difficult, however, to locate examples of research on more complex problems of a _purely_ prescriptive character which proved to be highly useful to the sponsor.

Complex problems usually require diagnostic research as a prerequisite to prescriptive research. While the experience on which to base a generalization is limited, it can be hypothesized that where research is commissioned to perform all three of the functions under discussion, its practical utility is likely to be maximal. The following example provides crude, but perhaps instructive, support for such a contention.

In this case, a radio network, faced with increasing competition from television, was finding it more and more difficult to sustain its audience. Having no clear guide lines as to how it might proceed to stem the tide, it commissioned a research effort to try to find out. To begin, the research organization devoted its attention to examining the conditions under which people still listened to radio in preference to television, and sought to specify the kinds of needs which radio might continue to satisfy more adequately than television. These were then translated into possible prescriptions for action and arrangements made to have them tested on an experimental basis. This led to further action decisions and a continued program of evaluative, diagnostic, and prescriptive research. The final success of this experiment in carefully applying research to a succession of policy decisions has still to be determined. However, there is now a good chance that a situation which had appeared hopeless to begin with will be effectively resolved.

b. Opportunities for Manipulation

From the viewpoint of the client, the motivation in commissioning research is ordinarily to advance his own objectives. Whether these are to reduce juvenile delinquency, to get more people to go to church, or to persuade them to buy a new car, the client's judgment of the utility of research is determined by whether or not it helps him to accomplish his goal. At the same time, however, the utility of research to him is dependent on his ability to manipulate the variables involved to his own advantage. Obviously the greater his control, the more useful a piece of research can be.

In the nature of things, some of the factors influencing human behavior are less subject to manipulation than others. In turn, some institutions or groups in society can exercise more manipulative control over a given factor than others. This has an obvious bearing on the utilization of social research in the following ways.

The results of research which successfully identify the variables operating in a given situation are usable only where the variables are inherently controllable and where the sponsor has the necessary manipulative power. They are not useful where only one or neither of these conditions applies. The former situation is exemplified by this example.

One of the Defense Departments was concerned with the amount of deviant (unauthorized) behavior engaged in by troops in basic training. At the same time it was puzzled over the fact that the amount of deviant behavior varied markedly between companies, even where different companies were composed of recruits drawn from the same backgrounds. A research study was commissioned to test the assumption that the variations might be related to differences in leadership between companies. The results of the study confirmed this notion and succeeded in specifying some of the leadership qualities related to high and low rates of deviant behavior within companies. The Defense Department was able to apply this knowledge in screening candidates for leadership roles in basic training units. In this case, the significant variables were inherently manipulable and the sponsor had the necessary power to control them.

Another case illustrates an opposite situation. Here, the sponsor, the alumni organization of a large metropolitan university, was concerned about its inability to arouse the alumni to a conscientious interest in the affairs of the university, and to an active participation in its development program. A study was undertaken to identify the determinants of the apparent alumni apathy. The results showed that the current apathy could be traced, for the most part, to the type of experience the alumnus had had as a student: the large number of students, the relative absence of campus life and, most importantly, his living at home and commuting to school. All of these contributed to a lack of emotional involvement in school life which, in turn, carried over after graduation.

In this case the variable was not subject to effective manipulative control -- it was not feasible to move the school to the suburbs -- and what little might be done was not within the province of the alumni association. The research report was reproduced in the alumni magazine and that was about the end of it.

In this last case, there was no basis on which to predict ahead of time that the research results could not be utilized. Strangely enough, there are occasions where research is commissioned on problems on which no action is feasible whatever the result. A case in point is a research project sponsored some years ago by a welfare agency. This agency organizes an activities program on a nationwide basis. Local chapters of the agency solicit cooperation from school, church, and welfare groups in sponsoring neighborhood units of the national movement. The national policy of the organization provides that no racial or religious restrictions may apply in the selection of members for these units. At the same time, it was known to national headquarters that this policy was being violated to an appreciable extent. Most frequently, this took the form of certain church-sponsored local units limiting membership to individuals affiliated with that religious denomination.

It was decided that something ought to be done. Before taking action, however, it was considered advisable to check the volunteer members of local chapters to see what their attitudes were toward the national policy. A study which was undertaken showed that there was relative unanimity of opinion that the national policy should be retained and strengthened. However, when it came to take action on the results of the study, national headquarters hesitated and finally tabled the matter. As they began to formulate a procedure for enforcing the policy, the full implications of their intended action were brought forcibly to mind. It was suddenly realized that enforcement would result in the withdrawal of a large number of church-sponsored local units from the movement. This was deemed less desirable than nonenforcement of national policy. It is apparent, of course, that the sponsor failed to perceive ahead of time that whatever the results of the research study, the cross pressures were such that no action on the policy matter might be taken.

The way the research is designed may also determine whether or not the results become subject to the sponsor's manipulation. Let us suppose,* for example, that a research organization is asked to design a study of the factors leading to juvenile delinquency among high school students in a municipal school system. On the basis of exploratory work, it is decided that the amount and kind of parental control experienced by the student is related to his delinquent behavior. A study is then undertaken which confirms this hypothesis and specifies the particular conditions in the home which seem to be responsible. When the school authorities attempt to apply this knowledge, however, they realize that they have no means at their command to control the home situation.

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* This example is hypothetical.

The research organization, in designing the study as it did, failed to see the problem in manipulative terms. However, it is conceivable that given the same problem, a research study might have been designed to produce more useful results. Presumably, the study might have focused on specifying the characteristics of the school rather than the home environment which are conducive to the outbreak of delinquent behavior. Had the results shown a positive relationship, it is likely that the school authorities might have had the authority to take some effective action. Their control over the school environment is obviously greater than over the home environment. This kind of difficulty, incidentally, often arises where the prescriptive functions of research are ignored and a problem is perceived purely in diagnostic terms.

2. THE ROLE OF THE CLIENT

Offhand, it might be expected that the client, by virtue of his role, would function wholly to foster utilization. Having commissioned a research project, he, among all the parties concerned, would be the most highly motivated to use its results. Where utilization does not occur, therefore, one would be tempted to look elsewhere for an explanation. However, an examination of the record suggests, perhaps surprisingly, that the client is very often directly responsible for the nonutilization of the results of research which he sponsors.

Clients, of course, differ in a variety of ways -- in institutional form, in size, objectives, in power and so on. The characteristics of clients which seem to be most influential in determining whether or not and in what way social research is utilized are these: (a) the amount and nature of their experience in the use of social research, (b) the relationship between the executive responsible for policy and the executive responsible for research, and (c) their relative amenability to innovate new procedures and ways of doing things. These same factors, incidentally, also influence the conditions under which research is commissioned and the form that it takes. For the purposes of the present discussion, however, the emphasis will be on their influence on utilization.

a. The Experience in the Application of Social Research

The judicious use of social research for applied purposes is an art which, like any other art, requires a basic talent and a considerable amount of experience. This particular art has not been highly developed to date and it is not surprising, therefore, that most sponsors of research are not well equipped to know how to use it. Those few who do, tend to be organizations with a long record of research activity, most often with a research unit highly integrated into their operations. Among the major groups of practitioners, business organizations have perhaps become most aware of the utility of applied social research and have had the most success with it. However, even here, the record is not consistently -- or even predominantly -- a favorable one.

It is difficult to specify just what comprises this special talent in using research. The following examples reporting a utilization experience of a sponsor with a history of applying social research to problems of policy and another for whom the particular study represented his first use of research, illustrate some of the issues involved.

The client in the first case was a drug firm with a long history of applying research to its marketing problems. In planning the marketing strategy for a radically new drug, the usual practice was followed of seeking the consultation of a number of research organizations. The responsible executives working in collaboration with representatives of one of these research organizations concluded that an effective strategy required some knowledge of the processes by which physicians come to innovate new developments in medicine into their practices. Systematic knowledge of this sort was not found to be available and the firm elected to commission a study to look into the matter. Recognizing the difficulties involved, it was decided, as a first step, to order a pilot study for the purposes of developing a set of hypotheses on the operation of the innovation process and of designing a methodology for its investigation. The results of the pilot study were reviewed by the senior executives of the company and in cooperation with the research organization; a more elaborate study was designed to test particularly those hypotheses involving behavior mechanisms over which the company might exercise some control. Upon completion of the larger study, a group of executives were assigned the responsibility of developing a program of action for following through on the findings. Plans were also made to test the effectiveness of the action program at strategic points. The client's past experience in the use of social research contributed to its successful application in the present case by making him aware of the crucial points at which research might be effectively applied and by directing him to focus attention on those variables over which he might exercise some control.

The second case is drawn from a research experience of an agency working in the field of public health. No one on the staff had had experience in social research and the agency had not had occasion to commission research in the past. However, responding to criticisms that its health education programs were ineffective, it decided to run a model campaign and to arrange for a research study to evaluate it. The scheduling of the campaign and the study, however, was poorly managed. Arrangements for the campaign were already completed when negotiations for the research effort were begun. The research organization was placed under pressure to work quickly to meet the deadline already established for running the campaign. As a result, the study was not as well drawn as it might have been. Nevertheless, it turned out to be technically adequate and substantively interesting. While its results did not demonstrate an appreciable change in the public's health knowledge, an imaginative diagnosis was made of the reasons for the relative failure. The anticipated function of the study for the client, however, had been to persuade critics of the efficiency of his educational activities. Having failed to perform this function, the research report was suppressed and its possible utilization as a guide to planning future programs ignored.

This case illustrates a number of the pitfalls which the inexperienced sponsor of social research may encounter. To begin with, he is more prone to commission research on problems which either do not require research or do not lend themselves to research inquiry. Secondly, he is likely to conceive the research as performing a very specific function and to ignore the subsidiary or complementary functions it might perform. Thirdly, he is likely to instruct the research organization inadequately as to his requirements. Fourthly, he tends to overlook the necessity for special facilities within his own organization to arrange the effort necessary to implement the research findings. And, finally, his expectations of what research can do are likely to be exaggerated and he is, therefore, more likely to be disappointed in and to disregard its more modest achievements.

b. Internal Communication Within the Sponsoring Organization

The sponsor of applied social research has obviously a more complex identity than the discussion, thus far, would indicate. The sponsor is ordinarily a business corporation, a government department, a labor union, or a social welfare agency having an intricate internal structure. To say that a particular organization commissions a research study obscures the fact that it is not the organization itself which is the responsible agent, but some individual or group of individuals within the organization. Within the sponsoring organization, the source of the decision to commission a research study has important implications for its utilization.

This decision may arise, of course, within any unit of the organization holding the authority to commit funds for special projects. It may be an isolated decision of a single individual or group or it may emerge from elaborate conferences between representatives of a variety of departments. In organizations with built-in research departments working on behavioral problems, that department may originate most or all of the research which is commissioned, or as in some cases, it may perform no such function but merely operate as a service unit to carry out requirements dictated to it by other departments. Not enough is known to say authoritatively just what bureaucratic form leads to the most judicious use of applied social research. However, the limited evidence does provide some ground for speculation.

Speaking generally, applied social research is most effectively used where the decision to use it is made at the top policy-making level. In such cases, the effect is to create a favorable attitude toward social research and to encourage its imaginative use throughout the organization. Furthermore, the effective use of research results often requires innovations in organizational procedures. Their implementation almost requires an interested and committed top management.

However, it often happens that the policy maker, whether he is responsible for originating a research study or approves a recommendation from a subordinate to have it done, does not actively participate in the research process himself. Where the research is contracted to an outside agency, for example, the responsibility for negotiating the contract, and for monitoring the study as it proceeds, is usually assigned to a subordinate. The relationship of this subordinate to the policy maker may be direct, may operate through the head of the research department, or may exist only on a non-personal basis with communication carried on by inter-departmental memoranda and reports.

Whatever arrangement is used, however, the kind of relationship which is established between the policy maker and the research "monitor" has much to do with how useful any research activity turns out to be. This point is perhaps most spectacularly exemplified in the social research experience of several agencies in the years following World War II. During this period, for a variety of reasons, what might be described as a research fad developed in these agencies. Special research divisions were established with unusually large budgets and given the responsibility and authority to commission research on a variety of human behavioral problems. To a large extent (how large it is difficult to say) this fad turned out to be a failure. An immense amount of research was done with very little practical effect.

It is impossible, of course, to explain this failure as due to a single cause. Nevertheless, it is true that within these agencies, an effective relationship between the monitoring staff and the policy makers was rarely established. Requirements were set forth, often exclusively in writing, to the monitoring units which, in turn, commissioned the research. Little further contact with the policy makers occurred until the research was completed. Even here, the principal contact was in the form of a final report. The results were seldom closely related to the requirements, and implementation could be accomplished only infrequently on the basis of the final report alone. To be sure, the research itself was undoubtedly frequently at fault. But the potentialities of even the usable research were seldom realized. This example is not an isolated one though it might exaggerate the communication difficulties experienced by most sponsoring organizations with respect to their utilization of applied social research. The importance of effective internal communication in this regard cannot be exaggerated.

c. The Flexibility to Innovate

A final organizational requirement for effective utilization of research is that the sponsoring organization have the flexibility to break with tradition and innovate new ideas. The action implications of social research are often radical in nature and no matter how sound they may be, most sponsors lack the courage to divorce themselves from traditional ways of doing things in favor of new and what often seem to be untested approaches. The factors which make for organizational flexibility in this regard are difficult to discern.

The cases which can be cited almost all fall into the category of change being a functional necessity for the continuation of the organization. One example which comes to mind is that of the voluntary association which over the course of twenty-odd years was instrumental in just about eliminating a major health problem. Faced with a situation of deteriorating need for its services, it commissioned a research study to investigate its potentiality for survival. The results recommended a radical departure from the organization's traditional program, which recommendations were acted upon forthwith.

A more usual case, however, is represented in the experience of a public relations department responsible, in part, for its organization's information program. An evaluation of this program suggested that much of the current effort was useless and in some cases, harmful to the organization's interest. A radical change in program was recommended, involving the writing off of large investments in equipment and arranging for a major turnover in personnel. The responsible authorities neither felt they had the power to act on these recommendations nor were they persuaded that change was necessary. The traditional method of activity had become too entrenched to allow it to be readily upset.

3. THE ROLE OF THE RESEARCH ORGANIZATION

A third set of factors bearing on the utilization of applied social research comprises those growing out of certain characteristics of the groups or organizations conducting the research. There are many occasions, as has already been reported, where the client elects to have a research requirement met within the framework of his own organization, either by the research department or by staff members especially hired for the purpose. The alternative procedure is to contract the research outside. This may be with an individual, for example, a social scientist at a university, but more often it is with an organization with special facilities and experience in applied social research. This organization may be a profit-making enterprise, an independent nonprofit-making institute, or a university-connected research facility. The research organization's influence on the utilization is likely to be a function of a) the nature of its identification with the applied concerns of the sponsor, b) its business ethics, and c) its research competence.

a. Identification with the Client's Requirements

Organizations vary with respect to their reasons for engaging in applied social research. For the commercial operation, the central manifest purpose is to earn a profit. However, the operation of this motive is tempered by the requirement to maintain a level of competence which will produce a steady clientele. For the nonprofit-making facilities, the motives are likely to be more complex. Here, manifest interest in profit is not relevant. However, the organization's continuity may be dependent on the maintenance of a minimum level of contract research. In such cases, the effect may be to arouse a concern to get contracts which is little different from the commercial firm's similar concern. However, even where the survival need exists in the nonprofit-making organization, it is likely that other considerations will also influence their acceptance of applied research commissions. They may, for example, be committed to a policy of accepting applied contracts only where the research promises to contribute to alleviating the social ills of society. Or, applied research may be accepted only where it provides special opportunities for advancing methodology or even for making contributions to basic knowledge. Finally, particularly for the university institute, the student training opportunities afforded by applied research may be the basic reason for engaging in such activity. How, though, does this relate to whether or not the research done proves useful to the sponsor?

It would seem that the criterion of maximal utilization would be most often satisfied where the function of applied social research for the research organization is primarily to earn a profit, and/or to maintain organizational continuity. Under such circumstances, it would appear to be in the research organization's best interest to devote its energies primarily to satisfying the sponsor. Satisfied sponsors generate additional contracts and these are essential to making a profit and to guaranteeing organizational continuity. However, a contradiction sometimes arises between the desire to make a profit or to survive and the need to conduct effective applied research. Research is likely to be done most effectively where it can be pursued without undue administrative constraints in the form of strict budgets, tight schedules, and enforced deadlines. Yet the imposition of these constraints may be essential if a profit is to be made or a loss avoided. Under these cross pressures, the research organization is often compelled to compromise the interests of the sponsor to its own survival needs with the hope that the sponsor will be satisfied with something less than an optimum research product.

A more favorable environment for maximal utilization is likely to exist where the interests of the research organizations parallel those of the sponsor. Concordance of this kind does not occur often and where it does, the subject matter of the research usually has a humanitarian content. A research organization may share a client's concern with reducing juvenile delinquency, alcoholism and the like, particularly if its program is oriented to work on such problems. Identity of interest of this kind may very well be reflected in the quality of the research done.

In the case of research organizations whose work in applied social research is predicated primarily on the belief that the advancement of science can be fostered by such activity, it is difficult to specify just how useful their applied research will be. On the one hand, the sponsor's practical concerns are likely to be subordinated to the research organization's own interests in the way the research is designed. For example, the design may be ordered primarily to set a test of hypotheses of primary interest to the research organization. On the other hand, the research organization's motivation to extend the study to include its basic concerns as well as the sponsor's practical ones may serve to produce sounder and more practical results.* One example which comes to mind is the case of a magazine which commissioned a nonprofit-making research organization to conduct a modest study to obtain a profile of its readers. In this case, the researcher extended the study to include an examination of the status functions of the magazine for the reader. The results were of scientific interest but also served the applied interests of the client by providing him with new insights into his readership which he was able to incorporate successfully in his promotion. However, there are cases on record which exemplify a less mutually satisfactory result.

b. The Matter of Ethics

This is probably not the place to enter into a needed lengthy discussion on the business ethics of research organizations engaged in applied social research. However, insofar as such ethical problems enter into the matter of utilization, some limited comment is called for, at least to the extent of pointing out some of the issues involved. Ethical problems having some relevance to utilization arise at the time the contract is being negotiated, during the course of the research itself, and in the terminal discussions on the application of the research findings.

There may or may not be a discrepancy between the client's image of the ultimate utility of the research findings and their actual potential utility. Very often, however, this discrepancy does occur and where the research organization is aware of it during contract negotiations it obviously must decide whether or not to enlighten the client. Whether or not this is done is, of course, determined by the nature of the research organization's relationship to the client, and by how important securing the contract is considered to be. In actual practice, there is clearly a tendency for the research organization's behavior to be governed by its subjective interests with the resultant tendency to promise more than can actually be delivered. In most cases, this probably happens quite unconsciously.

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* These same observations would appear to apply where the research is done for the purpose of student training though it is doubtful that the same standard of performance can be achieved as with a professional staff.

In the course of the research, ethical problems ordinarily arise around the matter of standards. Administrative constraints are a constant threat to the maintenance of standards and the research organization may feel obliged to abandon or compromise its standards in order to avoid administrative difficulty. This may take the form of compromises in the sample design, ignoring mistakes in interviews and the like.* The research organization's actual behavior, of course, is reflected in the quality, and ultimately the usefulness of its research.

In addition, there are the ethical problems arising in the process of interpreting the research results to the sponsor. The temptation to interpret the results beyond what the data allows is heightened as the contract reaches its terminal point, and the pressure mounts to evoke a positive sponsor reaction to the results. The response to this temptation has obvious implications for the research organization's future relations with the sponsor and for the orderly development of the whole field of applied social research.

Finally, cognizance needs to be taken of an overriding ethical problem which arises wherever the knowledge and methods of social science are applied to the solution of practical problems. This is the problem of deciding when, if at all, a research assignment is to be rejected because of the purposes for which the results are to be used. As has been said, there exists the danger that social research may be used to foster the special interests of certain groups in society to the detriment of others. While this is not the appropriate place to discuss what standards should be in this area, it is evident that the matter is a central responsibility of the individuals and organizations participating in applied social research.

c. Levels of Competence

That the research organization's competence has a direct bearing on the utility of the research it produces scarcely needs discussion. However, something might be said about the conditions which contribute to competence in the conduct of research. The ideal conditions would appear to require the research organization to be both substantively and methodologically competent to work on a given applied problem. In turn, the optimum situation for providing such competence is one where the research organization can focus all of its activities in a specified substantive field and has the resources to develop the methodology necessary for effective research in the area.

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* It may also take the form of limiting the analysis of the results, an aspect of the research process for which there are no generally recognized standards.

This optimum situation, it would appear, is most closely approximated where the research activity is incorporated in the structure of the action organization. There, the full benefit of accumulated experience can be applied to each new problem, and in turn each research study contributes to making the next one more effective. In actual practice, however, it seldom works out this way. The research departments of most organizations are not given the resources necessary to enable them to approach this potential. Instead, they are likely to operate primarily a service operation subject to the whim of a variety of others having authority over them. Nevertheless, in the long run the ideal administrative arrangement is likely to be one where the research operation is closely integrated into the action program.

Independent research organizations, whether profit-making or not, are not ordinarily in a position to exercise complete control over the commissions they accept. As a result, their opportunity for accumulating substantive experience in a particular applied area is limited. However, their continuity as organizations makes for a high degree of technical competence. The dilemma in this situation, of course, is whether or not technical experience equips the organization to carry on effective research in a variety of substantive areas. In actual fact, of course, most research organizations act as if this were so, though it is doubtful that this leads to the most effective organizational arrangement for maximizing competence in applied research.

It is conceivable that enough is now known to establish a blueprint for an ideal organizational arrangement for carrying on applied social research at an optimum level of competence. It is doubtful, of course, that the administrative and financial obstacles to its becoming a reality could be overcome. Nevertheless, it would be useful to clarify the goal.

4. INTERACTION BETWEEN THE CLIENT AND THE RESEARCH ORGANIZATION

The client and the research organization, as has been seen, independently influence the process of formulating, conducting, and using research. The way in which they interact during this process also has its effect. This effect is likely to be the result of a) who interacts, b) what they interact about, and c) how frequently.

a. The Parties to the Interaction

In the relationship established between the two parties to a research contract, the client is represented ordinarily by one or more of the executives who will ultimately be responsible for applying the research results, and/or by a representative of his research department. In turn, the research organization is ordinarily represented by its chief executive and/or by the person who will be directly responsible for executing the research. Now, what difference is it likely to make who represents the two parties? A categorical answer to this question is obviously impossible since differences in personalities, in experience, and in interest all contribute to make every interaction unique, at least in part. Nevertheless, the question can be answered in a general way.

All things considered, the interaction is likely to be most effective where both the policy maker and a qualified research technician represent the sponsor, and the chief executive and the project director represent the research organization. Since all of these individuals are primarily involved in the research activity, for one reason or another, joint participation in meetings allows for the fullest discussion of all of the issues involved and eliminates the need for supplementary communication which might become garbled. The principal danger of such full participation is that issues may be discussed or settled on irrelevant or irrational grounds. Where differences arise, for example, the policy maker may exercise his authority to force acceptance of this point of view. Or, the research organization's chief executive may coerce the project director to compromise on a technical point in order to insure good relations. These difficulties notwithstanding, the advantages of such full participation are likely generally to outweigh the disadvantages.

Where such full participation is not feasible, the nonparticipant may insist that he be informed of the decisions made and have the authority to challenge them. In this case full participation is still realized but in a less efficient way. Here, the effect is principally to confound the channels of communication and, in turn, the decision making process. Alternatively, the nonparticipant may completely divorce himself from involvement in the interaction. For example, the policy maker may transfer his responsibility to a subordinate or the research organization's executive may leave it to the project director to make all decisions for him. The transfer of responsibility, in such situations, however, is usually not complete partly because the substitute does not ordinarily have the experience to exercise this responsibility and partly because the necessary authority is not also transferred. As applied social research is now practiced, interaction between the parties concerned more often takes this latter form than the full participation discussed above.

b. The Content of the Interaction

Successful interaction is a consequence not only of who interacts but what the interaction is about. In the research process, interaction between the representative of the client and the researcher may serve these communicative functions: to clarify the practical objectives of the research, to establish a research design well suited to satisfying these objectives, to monitor the research while it is in process, to identify the applied implications of the findings and, of course, to settle administrative and financial arrangements. The optimum condition, clearly, is that the interaction involve full and detailed discussion on all these matters. However, this is singularly difficult to achieve.

The principal obstacle is that the participants in research conferences ordinarily perform a particular role dictated by their position, background, and experience. Thus, the policy maker conceives it to be his role to insure that his applied interests in commissioning the research are communicated and respected. The technical researchers are committed primarily to working out the details of the research design. The chief executive of the research organization, in turn, is concerned particularly that the administrative and financial arrangements are worked out satisfactorily. It seldom happens, however, that there is anyone at the conference with the necessary qualifications and authority to perform an integrating role. Some of the possible consequences are that the problem for research is inadequately formulated (or it is stated in diagnostic terms when prescriptive research is called for), the research is designed without taking the limitations of the sponsor's manipulative power into account, or a study is commissioned which can serve no possible applied function for the sponsor.

Most of the characteristics of the sponsor and of the research organization previously reported as having an independent influence on utilization also, of course, affect the content of the interaction between them. In the case of the sponsor, it will be recalled, there are his experience in research, the distribution of authority and form of communication in the internal structure of his organization, and his flexibility to innovate new procedures. In turn, the research organization's raison d'être, its research standards, and its level of competence have their effect on the interaction process.

c. The Occasions for Interaction

The final element influencing the success of the interaction has to do with when it occurs. It is not unusual for the sponsor and the research organization to confer only at the time that the contract is negotiated, and then to have no further effective communication with each other until the final report is submitted. And, in many cases the final report is submitted by mail without any provision being made for its being discussed. The implications of such limited interaction for the utilization of the research findings scarcely needs discussion. However, some explanation is obviously required to account for its happening so frequently.

Lack of time, more immediate pressures, the difficulties of arranging conferences are all likely to have their effect. A more crucial factor, however, is again likely to be the differing perceptions which the parties to the contract have of their respective responsibilities. The sponsor engaged, as he is, in the pursuit of an action program is likely to conceive of his role as primarily to apply the results of research. Its actual execution is beyond his capabilities and is properly the function of the research organization. The research organization accepts the role definitions of the sponsor and confines itself to performing its research function leaving the responsibility for utilization exclusively to the sponsor. The lack of interaction, therefore, is seen as desirable since it allows each party to perform, without undue interference from the other, its proper function.

The weakness of this point of view is being increasingly recognized as evidence accumulates that frequent interaction makes for more successful utilization of applied social research. The pattern which is beginning to emerge is one where both parties to the contract participate in all of the major decisions bearing both on the execution of the research and on the utilization of its findings. Contracts in such cases often make provisions for retaining the services of the research organization to work on the applications of the results long after the research itself is completed. It will take some time, of course, before the potentials of such arrangements are fully realized. However, it is conceivable that in the near future practitioners will become increasingly aware of the technical capabilities of research, and researchers, in turn, will become more expert in the art of application.

5. THE RESEARCH PROCESS

Whatever the effect of the way the problem is stated, of the sponsor's level of sophistication, of the ethics of the research organization, or of any of the other factors previously cited, it is the character of the research itself which is likely in the final analysis to be the crucial determinant of what use is made of it. Some of the special qualities of research studies which contribute to their being maximally useful have already been discussed. The degree to which their results are subject to manipulation, for example, was explored with some thoroughness in the discussion on the nature of the problem. In the section on the role of the research organization, some reference was made to some technical matters. No purpose is served by repeating the discussion of these issues here. Aside from them, however, three other qualities of the research investigation are related to effective utilization: its conceptualization, its comprehensiveness, i.e., its treatment of all of the relevant variables, and the degree of technical skill with which it is executed.

a. Conceptualization

Research studies can be roughly classified according to the level at which they are conceptualized. At the one extreme, there are studies which are directed at testing a set of clearly stated propositions. At the other, there are investigations which are principally concerned with the compilation of information of some kind. It seems fair to say that studies approximating the former extreme generally prove more useful than studies having the latter characteristic. The following example illustrates the point.

In an unusual experimental mood, a local welfare association commissioned two unrelated research organizations to work on the same problem. Their assignment was (1) to discover what motivated people to volunteer to contribute their time and energy to working in the interests of the association's current program and (2) to determine the extent to which these same motivations could be expected to operate under a changed program focus. It was stipulated that the association had not yet committed itself to changing its program and, therefore, that it did not wish volunteers to be informed during the course of the research that a change was contemplated.

One of the organizations proceeded by interviewing a random sample of volunteers on what had led them to volunteer. The replies were classified and the report on the findings consisted of a series of tables showing the proportion of respondents who had offered each of a list of reasons for volunteering. No specific attention was paid to collecting data on the persistence of these reasons under a changed program focus though the report included a set of speculations as to what might occur.

The other research organization proceeded in a somewhat different way. It began by undertaking an analysis of the characteristics of the current program and the anticipated characteristics of the potential program. This analysis revealed that certain characteristics were common to both programs and some unique to one or the other. A set of propositions were then formulated as to the relative weight of the common and unique characteristics in motivating volunteering. These propositions were then tested through interviews with a sample of the volunteers. The results showed that volunteers of specified kinds were primarily motivated to volunteer by the characteristics which were common to both programs, and the conclusion was drawn that their continued participation would be assured under the new program. The volunteers whose motivations derived from the unique characteristics of the current program were also identified and the research report made clear that their continued participation in a new program was less likely to occur. The welfare association's reception to both reports was friendly but it based its plans primarily on the results of the latter, electing to proceed with a new program on the grounds that enough volunteers would be retained to assure its success.

b. Comprehensiveness

Studies also vary in the extent to which they incorporate in their design all of the variables which might have a bearing on the decision facing the sponsor. The principal danger here is that the sponsor and/or the research organization fail to recognize in advance that certain constraints operating in the sponsor's organization are likely to intrude on the decision whatever the results of the research. The earlier reported study sponsored by a national welfare agency is a case in point. The following example is also relevant.

The sponsoring organization, a manufacturer of office machines, had redesigned one of its stock machines and was planning to invest in the manufacture of the redesigned model on a mass scale. Before doing so, however, it was anxious to predict consumers' reaction to the redesigned machine and, specifically, to learn whether or not they would prefer it over the old model to a sufficient extent to warrant the investment in its manufacture. A simple experimental study was commissioned to find out. The results showed an almost unanimous preference for the new model. However, as the company proceeded to plan for its manufacture, it was discovered that the manufacturing costs of the new model were going to be substantially greater than for the old machine. These additional costs could not be absorbed but would have to be added to the selling price of the new machine. It was necessary, therefore, to undertake the experiment once again, taking the price differential into account. The results were just the opposite of those obtained from the first experiment. Consumers, while still expressing a preference for the redesigned machine, were not impressed that the advantages would warrant the additional investment in price. It is obvious, of course, that if the price factor had been taken into account at the outset, a single study would have sufficed. Such minor oversights often turn out, as this example illustrates, to name major repercussions for the utility of research findings.

c. Technical Proficiency

The confidence which can be placed in the results of research is, of course, an obvious additional factor influencing their utility. This is primarily a function of the technical efficiency with which the research is executed. It involves questions of standards, of controlling for bias, of the representativeness of the findings and the like. A variety of complications may arise in the course of trying to utilize the results of technically inadequate research.

In many cases, of course, the client fails to recognize the technical inadequacies and proceeds to use the research findings without reservation. This may or may not boomerang depending on the conditions of the case. That it sometimes does boomerang is illustrated by the following classic case. An aircraft manufacturer proceeded, after the last war, to mass produce pleasure aircraft in anticipation of a booming market for such a product. This market had been predicted by a research study which it had commissioned and on which it based its manufacturing program. The market, as is well known, failed to materialize.

Where the technical inadequacies are recognized, the practitioner has obviously to make a decision as to what to do. He may decide to ignore the findings. More often, however, he is likely to gamble that the results provide a more adequate guide for action than anything else available to him and proceed accordingly. This is most often the decision where the major technical failing of the research has to do with the representativeness of its findings. More for budgetary reasons than anything else, studies are often undertaken which purport to diagnose the behavior of a universe on the basis of a dangerously small sample of that universe. Clients, though aware of what is going on and in fact often responsible for it, usually elect to act on the findings rather than make the additional investment necessary to check their reliability.

It is difficult to estimate the extent to which the results of research are ignored on technical grounds or how often the application of the results of technically inadequate research produces unanticipated consequences. There can be no question, however, that technical considerations are compromised in a considerable proportion of research studies of an applied character.

CONCLUSIONS

It is evident from all that has been said that the art of effectively applying the methods of social research to the solution of practical problems is just beginning to be learned. At the same time, it is clear that it is in the interests of both the users of applied social research and those who conduct it to accelerate the learning process. If nothing else, the present paper has demonstrated the feasibility of slowly developing a set of principles to guide the utilization process.

However, very little is likely to be accomplished without some major shifts in current practices. Ignorance in these matters is in part a function of the absence of communication among those who use social research for applied purposes. There is no procedure for sharing experiences. Each new situation is treated *de novo* and the mistakes made in one case are very likely to be repeated in another. There is a need for the accumulation of case studies and their wide circulation. There is also a need to encourage the evolution of a new occupational role -- that of the middleman who is trained in both the methods of research and the art of utilization. Many of the difficulties that have been reported arise because no one involved is expert or even knowledgeable in all of the phases of the research and utilization processes.

There is a need, too, to know more about the applied functions which social research can *and* *cannot* serve. Again, this is partly a matter of accumulating and sharing experiences. It is particularly, however, a responsibility of the social scientists engaged in applied research to know the limits of their sciences and to communicate them effectively.

Finally, there is a need to find out where applied social research may lead us and to specify the conditions under which it *ought* to be applied. This it would seem, is a responsibility of the social sciences at *large*. It is only out of their experience that applied social research can be practiced at all and they should share in the decisions as to ends to which it is put.

TWO CASE STUDIES OF UTILIZATION OF THE BEHAVIORAL SCIENCES

By Ronald Lippitt

Here are two cases of efforts to utilize the results of behavioral research, one of which was successful, the other not. After comparing the two cases, Dr. Lippitt raises some thought-provoking questions concerning the utilization process. The author is a professor of psychology in the Research Center for Group Dynamics, at the University of Michigan.

Introduction

The following case description attempts to analyze some of the significant differences between a case of relatively successful utilization of behavioral science and a relatively unsuccessful one. Fortunately it is possible to make quite a number of rather direct comparisons because both case situations are national organizations conducting youth programs in local communities under the direct leadership of lay volunteers with supervision by local professional workers. In both cases there is a national office where program materials are prepared, a great deal of work on the training of volunteers, and a staff of field workers maintaining liaison between the national office and the local program. Both organizations put major emphasis on character education goals, with group meetings being conducted in noncompulsory situations where the programs must compete with other leisure time attractions of the young people.

The two cases are described under parallel headings. At the end of the cases there is an attempt to formulate a few questions about the process of utilization of behavioral science which seem of interest to the author.

THE CASE OF ORGANIZATION A (YOUTH)

The Motivation for Turning to Behavioral Science Resources

At the time this case begins organization A had a number of different previous experiences in the use of behavioral science. Primarily they had used child development specialists as consultants on interests and vocabulary of various age groups in preparing program materials. They also had a highly developed statistical operation within the organization for the continuous collection of data on membership and membership turnover. A great deal of emphasis was placed on getting good and up-to-date "feedback" on the membership situation. The desire to make additional use of behavioral scientists and scientific methods probably had at least three different sources:

"We ought to have even more of them in our program."

The top leadership of the organization, continuously reviewing the membership statistics and the estimate of unreached potential, had feelings that there was a big discrepancy between present membership and what they could aspire to as a potential membership. They felt that more facts would uncover ways of attracting a significant number of the nonmembers.

"We are certainly successful but we don't have any clear-cut material we can use for proof."

The top leadership of the organization were continually emphasizing in public and staff communications the significance of the character education effects of the program, and placed great weight on various anecdotal evidences of these effects. They felt it would be desirable to have more clear-cut and systematic proof of the important effects the program was having.

"Carrying on research is a good thing."

The top leadership of the organization were very much influenced by the values and procedures of "big business." In this context "doing things scientifically" or "carrying on research" had the meaning of keeping ahead of competitors and doing things efficiently. The professional leadership of the organization felt that being able to "point with pride" to a research activity was one evidence of good stewardship in carrying out their responsibility for the leadership of the national program.

To a major extent these motivations toward using behavioral science existed in the top leadership of the organization. There was relatively little evidence of pressure for innovation, or at least for the use of scientific method in the process of innovation, in the field personnel of the organization.

THE CASE OF ORGANIZATION B (YOUNG PEOPLE)

The Motivation for Turning to Behavioral Science Resources

Organization B had also had considerable experience with using behavioral scientists as consultants on the age level content of program material. Although their data were much less adequate about the membership of their local groups as compared to potential membership they were quite convinced that the general situation was one of a relatively small number of the eligible young people participating in the program, and perhaps even a trend toward less and less membership involvement through time. Organization B was somewhat more self-critical about this state of affairs, putting more emphasis on questions about how to improve the quality of the program rather than more quantitative promotional thinking about how to "reach the unreached." Probably the core motivational context seems to be formulated a bit differently than for A:

"How can we improve the quality of our program for the older age groups so that they will have a more significant experience?"

In trying to work on this problem, the professional leadership, with consultants and advisers, had worked through a basic change of policy about the content of its program and the role of the lay leadership in working with children and young people. To prepare the material for each age level they had defined an experimental period of trying out the material with pilot groups providing training for the lay leaders and an elaborate process of record keeping and consulting to try to see how the material worked. There was no formal evaluation designed and no quantitative evaluation procedures. No behavioral scientists were involved in this pattern of program experimentation.

"How can we improve the quality of our leadership to do the more difficult job which is being developed?"

In organization B there was considerably more sensitivity about the interpersonal role of the lay leader as the key element in the program, rather than the content of the program material. There was a strong feeling of need to develop improved training operations for lay leaders.

The actual initiation of collaboration with a team of behavioral scientists grows out of a third motivational context which existed in a local program rather than at the national level. One of the local professional leaders had invented a uniquely different approach to a program for older adolescents. His direct observations convinced him that the program was a significant improvement over previous programs in attracting members and stimulating desired character education effects. He felt a need to get better evidence of these effects, because of his own interest and because of his desire to have an impact on the national program development effort. So we could identify a third motivational context as:

"How can I get evidence that my local experiment is worthy of national mention and incorporation?"

We are now ready to turn to what actual initiative and paths of action developed from these motivational contexts.

THE CASE OF ORGANIZATION A (YOUTH)

II: Establishing Relationship With Behavioral Science Resources

The major action of organization A was to establish a research unit within the organization, locate it administratively as a staff unit reporting directly to the top administrator (rather than being incorporated in any of the operating units having to do with leadership training, program materials, production, etc.). In establishing this unit it seems clear that the director of the organization selected a person whom he perceived as having high prestige in the field of professional practice but who had also established some reputation in applied research. This person was seen as sharing the character education goals of the organization and as not being an impractical "university fellow." This new director, aware of his need to build research technology into his operation, recruited a young research specialist who could be sold as having training in the field of professional practice and also experience with the particular program of this national organization. A fairly generous initial budget was given with the understanding that specific research operations would be planned and presented for staff approval. The top leadership seemed to feel pleased that they had adequately tested the loyalty of the new behavioral science team and that the administrative situation was one of safe control. The behavioral scientists did very little exploratory testing of potential conflicts between their role as employees and their role as scientists with loyalty and responsibility to the broader field of scientific development. No specific problems were defined as the initial starting points for work. There was to be a period of exploration and development of plans to be presented for approval.

THE CASE OF ORGANIZATION B (YOUNG PEOPLE)

II. Establishing Relationship With Behavioral Science Resources

In organization B the first initiative did not come from the national staff but from the local professional worker who was attempting to develop a program innovation in his own community which he believed might have national significance. During a professional conference he became acquainted with a behavioral scientist team. He reviewed his interest in a study of what was going on in his local youth group. The scientists saw this as a challenging applied research problem, and also as an opportunity to explore the phenomena of decision-making in adolescents and the relationship between values and behavior. Because of his relationship to the national staff the local professional leader was able to stimulate the setting up of a modest research contract between the national office and the behavioral scientists to make a study of the community demonstration project. There was explicit acceptance of an evaluation research goal from the point of view of the organization and of the basic research interests in adolescents as formulated by the collaborating scientists. As we will see later, this initial relationship developed over a three-year period into a much closer collaboration between the national staff and the team of behavioral scientists.

THE CASE OF ORGANIZATION A (YOUTH)

III. The selection of problems to work on

In the months after they had been established, the research unit in organization A were surprised by the fact that no representatives of other departments in the organization came to them with any problems that they wanted help in solving. It seemed clear that there was a feeling that it was a sign of weakness to have a problem which one could not cope with without help from a new and "competing" unit of the organization. This situation was further clarified by the top leadership asking the research unit to develop its own ideas about a program and to make a presentation in order to secure approval and special budget for conducting one or more research projects. Therefore, the research team went ahead to define a problem for study which seemed to them of basic significance for the organization and which was in line with the previous research experience and methodological skills of the research specialist. This was to be a study of a sample of unsuccessful and successful groups to try to generalize about the main factors making for successful and unsuccessful group operation and leadership. The research unit prepared elaborate memoranda on the design and methodology of such a study and made presentations to various staff committees. There was no great evidence of enthusiasm or rejection for the plan. It was duly approved by the administrative staff after a review by an advisory committee of outside research specialists who expressed their approval of the research plan. The research units felt somewhat hampered by the lack of concern and controversy over the problem of defining appropriate criteria of successful and unsuccessful groups. No close liaison with operating staff was established in planning the conduct of the study. "If this was the study the research people wanted to do then they ought to go ahead and do it."

THE CASE OF ORGANIZATION B (YOUNG PEOPLE)

III: The selection of problems to work on

In the case of organization B, as has already been mentioned, a specific request for help was formulated by a professional leader in a local community. He wanted to get some objective assessment of whether the experimental program he had developed was having a significant effect on the young people and it seemed clear that he was hoping this type of research attention would make his local project a visible demonstration which might then be developed and adopted more widely. Because of the purposes of the program the problem became one of measuring changes in the approach to decision-making by the members of the experimental groups. The research workers saw this as an opportunity to further their own interests in analyzing the process of decision-making. This seemed a necessary step in a program of measuring change in decision-making, as well as because of the theoretical interest in the decision-making process itself. In this sense, the selection of a problem seemed to be a natural meeting ground of an applied question and an area of theoretical interest. The starting point in organization A did not represent any such initial focused "sense of problem," nor did the researchers have any such focused research interests to promote.

THE CASE OF ORGANIZATION A (YOUTH)

IV: The fact finding or diagnostic phase: Ways in which the behavioral sciences were utilized

Selecting a sample

The program people of organization A had in the files much anecdotal material on good and bad practices in local youth groups. This material had been picked up by field staff during field trips, and described in their field reports. The program department were inclined to feel that they were "adequately in touch with what was going on" by means of these anecdotal reports. Perhaps the first behavioral science importation of which the operating people became aware was the introduction of the idea of a systematic sampling procedure in getting information from the field about what was going on. They became involved in helping select representative communities in which to do the study, and in developing a procedure of selecting the specific groups in order to get wide variations in practice. It was the impression of the research staff that some of these discussions about sampling had a certain amount of educational impact on the administrators and field staff in operating units. It was obvious, however, that there was great resistance to the idea that they might not be "really in touch" with what was going on in local program activities.

II. Using behavioral science resources outside the organization

The research staff hoped in the beginning that the observations and the interviews in the variety of local communities might be carried on by local professional workers who would be given training and supervision by the research department. As the project planning developed it seemed to become clear that this was the unwise idea, both because the data collection to some degree had the meaning of evaluating program activities in a local group, and secondly because the group observation and interviewing instruments which were being developed seemed to require more background of scientific training than could be found among local professional workers. Therefore, cooperative arrangements were set up with three university centers where students receiving behavioral science training could be recruited and trained in the specific research operations and where an interested professor would function as supervisor and liaison person. These three professors were not only interested in the kind of scientific activity which the project represented, but had personal relationships with the two behavioral scientists in the research department. One of the adaptations required in this arrangement was making provision for some of the students to carry on special projects which could be acceptable locally as thesis projects. Also the three professors became a part of the project planning committee. They had certain scientific orientations and interests which influenced the methodology finally used in data collection. So here we see the same problem of compromise and the synthesis of the research goals and plans of the organization and the interests and theoretical orientation of behavioral scientists not located within the organization which already has been referred to in the development of the project in organization B.

III. Conferences on measurement criteria

Critical probing about criteria about program success and failure represented a third type of behavioral science importation at this stage of the research program. The research staff felt it was quite crucial that the data collecting procedures used should focus on characteristics of program and group activity which would be regarded by the operating department as symptomatic of good and bad practice. But in trying to develop staff conferences on these questions they ran into three types of problems. First of all, it was clear that there was considerable disagreement among various top staff members as to what were the important evidences of successful practice. A second problem was that most of the statements of good practice were made at such a vague and global level that they did not provide good bases for the development of quantitative measurement procedures without much more refinement and differentiation of the ideas expressed. A third problem was that the statements about good practice seemed, to the behavioral scientist, to be resting on assumptions which were not warranted by existing knowledge from research in the field of child development, social psychology, and education. For example, it seemed to be assumed that if the adult leaders were carrying on certain activities with their group these would be having the desired character education effect, regardless of leadership style in the conduct of the activities. Also it was being assumed that if the youth were showing high interest and involvement in particular activities, then these activities would be having the desired effect in terms of personality and character development. The research workers found it difficult to get clarification of this problem by bringing in interpretations of basic research which had been done elsewhere. It is certainly clear that the measurements which were finally adopted represented the best judgments of the research staff to a much greater degree than they did the statements of priority criteria expressed by the administrators.

IV. Importation of fact-finding methodology

As we have already indicated, the research staff brought with them experiences with certain kinds of fact collecting methodology. These experiences certainly were a strong influence in the selection of the types of fact-finding procedures which were used, although all the instruments were revised on the basis of pilot study work in the specific field situations of this organization. This problem of the degree to which fact-finding procedures developed elsewhere are directly relevant for a particular research problem of a particular organization is an important issue in the importation of behavioral science into a given applied setting. This problem is in many ways parallel to the problem of whether research facts discovered elsewhere can be generalized to fit the interpretation of the local situation with its problem.

THE CASE OF ORGANIZATION B (YOUNG PEOPLE)

IV: The fact finding or diagnostic phase: Ways in which the behavioral sciences were utilized

Introducing a control group

In this phase of diagnostic fact finding about the effects of the local program with the adolescents' discussion groups, one important behavioral science importation was the notion of a control group. This is quite parallel to the introduction of sampling procedures as described above in organization A. The local professional leader was very quick to realize that even though certain types of growth in maturity of decision-making might be found in his young people over the course of the year by introducing certain measurement procedures, still it would be quite unclear whether all this change could be accounted for by the normal course of growth and development of high school age teenagers during the course of a year of growing up. He helped actively in locating and getting the cooperation of a control group of comparable young people who were not involved in the experimental program.

Locating measurement personnel resources

The research had to be conducted at a very considerable physical distance from the university location of the research team. The research budget was very modest. Therefore, the research team decided to recruit and train two or three local university trained persons who lived in the community. As in the case of organization A, the recruited measurement personnel were paid at professional rates for their research work. After the initial training the recruited personnel were on their own to schedule and conduct their interviews and to get them turned in. This is in contrast to the plan in organization A where a local professor acted as a continuing supervisor of the work of the observers and interviewers. It proved quite difficult to maintain professional standards of data collection and writeup without this type of local supervision, with personnel who were college trained but did not have any specialized training in behavioral science research methodology.

Development of measurement criteria

Without any defensiveness the local leader supplied the research team with tape recordings of all the meetings for the previous year as a basis for their pilot work in the development of appropriate measuring tools. He evidenced great insecurity in his own judgment about which symptoms could be taken as evidence of the success of the program. He seemed to feel that the research team, with their background of knowledge of theory and research would be able to make better judgments of "what should be measured." Because of the physical distance the research team did not spend as much time as would have been desirable with the professional practitioner getting as much clarification as possible of the desired outcome of the program. They were certainly strongly influenced in their judgment by their own theoretical interests in certain dimensions of decision-making which they felt were of major significance, and should reflect changes in decision-making if the program were successful.

The use of scientific knowledge about participation

Possibly one source of behavioral science knowledge, relevant for utilization, is often overlooked. This is the knowledge which has been accumulated about the social psychology of participation as it relates to the readiness of individuals and groups to provide information without defensiveness or inhibition. The research team in this project was quite careful to involve the young people and their parents in discussions about the research process in order to secure cooperation in information giving. The conflict which came up, as it often does, was around questions of how much sharing of research goals and plans there could be without contamination of the research results. As Blum has pointed out, one may get just as much or more contamination very often by not getting high psychological involvement in the research activity and therefore getting careless or biased or inhibited information giving.

Bringing in specific theoretical interests

As we have mentioned, one of the important bases of motivation for the research team was the fact that the practical program focused on decision-making and an attempt to improve decision-making which seemed to be closely related to the theoretical interests of the research team in the phenomena of "inner-direction" and "outer-direction" in decision-making. This linkage of a practical interest and a theoretical interest is probably one of the significant features in this project in explaining the type of motivation and collaboration which has developed.

THE CASE OF ORGANIZATION A (YOUTH)

V. The developing and sharing of insights and recommendations from fact gathering

In most situations where the behavioral scientist is trying to make a contribution to an operating program there is a period during which diagnostic information which has been gathered has to be processed or reviewed in certain systematic ways so that relevant insights can be derived. Sometimes the insights are shared directly with the operating people. In other cases these insights are used as the basis for formulating recommendations which suggest certain lines of policy or action. In reviewing the material of our two cases, it seemed possible to identify several aspects of this stage of behavioral science utilization.

The issue of time lag in processing information

In organization A the information which was collected was in the form of quantitative observations of leadership and program activities in the sample of groups, and also in the form of questionnaires from group members and interviews with the leaders. The material was complex enough so that it was clear to the researchers that a series of activities involving coding, machine analysis and statistical work would be required before the relevant insights and generalizations could be derived from the information. However, there were many evidences that the administrators and field personnel were unprepared for and irritated by this time lag, and were rather impatient with attempts to explain why such a delay was necessary. This led the researchers to make a variety of efforts to provide partial units of interim information which it seemed might be of interest and might stimulate insights which would be consistent with what could be expected to come out of the more complete processing of the information. The researchers, trained to be cautious and relatively systematic about arriving at generalizations, felt irritated by this pressure to provide anecdotal and partial reports which took energy away from analysis activities and seemed to run the risk of creating wrong expectations and stimulating incorrect generalizations.

Feedback and standards of generalization

Out of the processing and the analysis of the information various interpretations seemed to become clear; the research staff plunged wholeheartedly into the preparation of visual aids to present the information for discussion by administrative personnel and field staff. Here another dilemma developed. When "the facts" were presented in organized fashion (so the researchers thought) as a basis for interpretive discussion by the practitioners, then the practitioners requested summary interpretations and recommendations for practice from the researchers as they began to feel uncomfortable in struggling with the meaning of the data. However, when the researchers attempted to emphasize recommendations in their presentation, then the staff almost entirely neglected looking at the data and focused their energies on critically evaluating the proposed new practices. A third problem kept arising, occurring when interested and thoughtful staff members derived generalizations from the facts which seemed to the research workers to go beyond the scope of the available information. The efforts to show why the generalization was too broad, or what additional information might be needed in order to clarify the generalization frequently led to irritation and the feeling on the part of the practitioners that the researchers were really not interested in making their material helpful in relation to practical problems. The research team did find that discussions of the data did seem to proceed more effectively where presentations of findings and initiation of discussions were carried out by a presentation team which included both research personnel and a professional operating person who had been involved in the project at the local level.

The research activity as a discrete activity or as a continuing process of investigation and interpretation

In organization A the administrators referred to "the study" and seemed to be evaluating the worthwhileness of the research department and of the behavioral scientist in terms of whether "the study" had produced the answers to the various questions they were interested in. There seemed to be a feeling that if research were worthwhile it ought to provide answers to the variety of daily questions in which they were involved, and which of course have not been the particular focus of the fact-gathering activity.

The merging of practical questions and research interests

During all the research interpretation activities there was a continual interaction process in which the researchers were attempting to get the practitioners to view the findings through their eyes and to become "more like researchers" in facing facts and drawing inferences; and the practitioners were attempting to get the researchers to "talk and think like practical people with jobs to do." In the case of organization A this interaction tended to result in irritation and emphasis of differences, rather than to stimulate increasing integration of the research staff into the organization.

THE CASE OF ORGANIZATION B (YOUNG PEOPLE)

V. The developing and sharing of insights and recommendations from fact-gathering

The issue of time lag in processing information

In organization B a different situation arose. The research instruments which were used were experienced by the youth and leaders as learning situations. There was much less interest in getting data on the effects of the program than in getting revisions of the data collection procedures for use in their own program discussions, and getting back summaries of the information for purposes of discussion and study. The enthusiasm of the local leadership about their collaboration in the research process was communicated directly to the national program staff so that the program staff seemed to become more interested in the adaptation of the research methods for program use than they were in getting the evaluation findings about the effects of the program. In one sense, the two cases are similar. In both situations the researchers felt some sense of irritation because of the demands being made on them by the practitioners which prevented devoting complete energy to the processes of more basic analysis and systematic summarizing.

Feedback and standards of generalization

Because they had started with only one experimental and one control group the researchers were able to make a strong case for the dangers of generalizing from the rather positive findings of the initial research exploration. It was much easier for the practitioners to accept the fact that additional groups would need to be studied before any very significant conclusions could be drawn. The main generalization drawn from the visual presentation of the findings of the first year was that the local program innovation looked promising enough to warrant more general exploration of its usefulness in additional experimental groups. There was a strong expectation on the part of the practitioners that the research staff should become involved in the practical modification and extension of the experimental program to other groups. In this respect there was a tendency to generalize that the people who had "studied the program" would be able to make practical modifications and applications. The motivations of the research staff tended to go in this direction so they probably were tempted to become involved in matters of professional performance more than was warranted by their research responsibility and their practical skills.

The discrete study versus a continuing process of research

As indicated above, there was very little inclination on the part of the practitioners to expect that the initial study should solve all of the problems of program development and evaluation. The local practitioners and the national administrative program staff very quickly developed an expectation that the collaboration between the researchers and the practitioners should be a continuing process. They expected a series of decisions about what should be done next by the researchers and by the practitioners in order to solve the long-range problem of evolving a rational and effective discussion program for the young people and developing appropriate materials and training devices for training the adult leaders.

The merging of research and practical interests

As has been suggested above, in the case of organization B, the practitioners became actively involved in wanting to integrate research tools into the regular operating program, and the researchers involved in becoming partially practitioners in working on modifications of the practical program, and on materials for leadership training. This process was also facilitated by the administrative assignment of one of the most interested practitioners to serve as a liaison person with the research team. Part of the data collection in the field situation became his responsibility, and he became involved in carrying out some of the simpler procedures of data analysis in his office, under the supervision (from a distance) of the research team. This very considerable merging of research and practical interest and function probably resulted in a lowering of standards of research and a diminishment of energy devoted to basic theorizing on the part of the research team; and also probably led to rather uncritical acceptance of the value and significance of the research findings on the part of the professional and administrative staff.

THE CASE OF ORGANIZATION A (YOUTH)

VI. The utilization of the findings, and continuity in the use of behavioral science resources

The process of sharing findings and reacting to them as described in the previous section probably provides some fairly good predictions of future utilization. This is not always true, however, and we need to look separately at the extent to which there is genuine "follow-through" on the implication of the interpretations and recommendations which have been derived, and a continuity in the use of behavioral science resources to cope with other operating problems of the organization.

Dissemination of insight through the organization

In organization A, top management saw the research as being primarily done to provide clues for themselves about ways in which more successful programs might be initiated and supervised by them. There was no great enthusiasm for widespread dissemination of the findings of the study. However, the research staff put a great deal of energy into summarizing their findings for the local leadership and used a significant part of their own research departmental budget for publication and distribution of the findings "to the field." They readily admitted to themselves by this time that one of the important motivations for doing this was because of their feelings of frustration because of the lack of receptiveness of the top administrative units. Many evidences of active interest "from the field" to the findings of the study considerably buoyed up the morale of the research staff.

Use of the findings by decision-makers in regard to policies about program practice

As suggested above, the research staff were beginning to feel rather frustrated with what they felt was the lack of responsiveness of the key decision-makers to the use of the research findings. A review of the findings, however, suggests that perhaps the main implication of the findings was one of uncomfortable "shock effect" about the inadequacies of current practices, rather than any very clear-cut implications for ways of improving practice. The major recommendations had to do with putting more emphasis on human relations understandings and skills in the leadership training program of the organization. This type of program modification was not an easy one to accept or to develop. Perhaps the main irritation of the research workers was that they did not feel any increase in the efforts of full-time administrators to seek their consultation and to review with them possible program innovations that might be in line with the findings.

Incorporation of research methodology into on-going program practices

The research staff in organization A put considerable effort into modifying and simplifying their fact-getting procedures so that the instruments could be used as the basis of periodic or continuing program assessment by the national staff or by local professionals. One of these instruments was published in the professional house organ of the organization with an offer to supply copies of the instrument to any local professional who wished to use them. There was a fairly active demand for this instrument from the field. None of the national program staff or field staff indicated an interest in using such methods as part of their own repertoire for "keeping in touch with the field."

Trends in the further use of behavioral science and behavioral scientists

The research staff in organization A felt there was very little evidence of a developing demand for their resources in the solving of operating problems, or in wanting to use their "general wisdom" about the behavioral sciences as a basis for consultation on operating problems. There seemed to be a number of "younger people" in each of the operating departments who were quite open-minded and eager to use the resources of the research staff, but who felt rather constrained by the attitudes of their superiors. The research staff itself did initiate a proposal for another research project in the field of leadership training which seemed to take the next step suggested by the implications of the first study. The study was approved and went ahead, but even though it was on more specific problems, the project tended to remain a project of the research staff rather than an activity carried on in collaboration with the leadership training staff of the organization.

External contributions to the profession and to the scientific disciplines

As research findings of more and more general significance accumulated from the processing of research findings it seemed more and more important to the research staff that they should be making contributions to professional workers with youth in other organizations, and to scientific colleagues through professional journals and professional meetings. Administrative policies were developed which placed strong barriers against the communication of data about the organization which could be construed as critical in any way. Several minor reports were written for scientific journals, but the discontent mounted.

Alienation

This process ended with the resignation of the research staff.

Epilogue

A much reduced research activity was continued by the organization, with the appointment of a trustworthy practitioner from within the organization as the director of research. Various membership accounting projects were developed and concrete administrative studies which could be quickly accomplished. But the director of research, partly because he was an alert young person, and partly because he was interested in making something significant out of his role of "research director" began to develop interests in the broader problems of program evaluation and development. He found these interests supported by the "network" of young staff members who had been the interested collaborators with the previous research staff. It was evident that a certain amount of significant "in-service training" in scientific outlook and values had taken place. The research director selected a concrete program problem to work on -- the interests of older youth. He decided that the research should be done by an outside research agency rather than by expanding the staff within the organization. By a skillful process of involvement he was able to get approval for a sizable research contract with a university-based research institute to conduct the research. Clear-cut recommendations about program modifications have emerged from the large scale study. The research director is currently expressing considerable frustration and pessimism about the lack of any movement toward program modification, although there seems to be considerable acceptance of the validity of the findings from the study.

THE CASE OF ORGANIZATION B (YOUNG PEOPLE)

VI. The utilization of the findings, and continuity in the use of behavioral science resources

Dissemination through the organization

In the case of organization B the findings from the pilot study with several groups led to the setting up of a program development committee made up of representatives from the national program department, from the local professional leadership, and from the research staff of the university-based research institute. This group made the recommendation to the national administration that a more complete experimental tryout of the modified program should be made in one geographic region, with careful analysis of all the technical problems involved in program dissemination, before the results of the action research project should be disseminated throughout the total organization. Part of the present third phase of the research is to analyze the most appropriate procedures for insuring adequate dissemination of the new program and of the evaluative research on which it is based.

Use of the research by decision-makers with regard to policy formation

The program development research activities in organization B are jointly controlled by representation of the top policy makers in the national office, top policy makers in a regional office, and the research workers from the university. A major problem of the research workers has been to slow down the use of the findings by the decision-makers until a more valid set of data could be collected. The decision-makers are continually pushing for the revising of policy decisions on the basis of the research activities.

Incorporation of research methodology into on-going program practices

One of the major characteristics of this particular applied research activity is that almost all of the research instruments have been modified and simplified to make them part of the regular materials to be used in the on-going program. These instruments are being used to provide group leaders with bases of program evaluation, and also to provide program participants (the young people) with insights through analysis of the findings which come from using measuring tools. Research tools such as a sociometric procedure, an observation technique, parent rating scales, and self interviews, have become the core of the applied program. All of these instruments were initially developed purely for information gathering purposes by the researchers.

Continuity in the use of the behavioral sciences

One of the major problems of the research staff is that new research problems are posed much faster than previous research questions get answered so that at any one time a half dozen sub-projects are being worked on by the team composed of research workers and practitioners. A second problem is that the practitioners have come to expect the research workers to utilize directly their behavioral science orientation by functioning as fellow practitioners in some of the experimental program activities such as leadership training, consultation with leaders, planning of conferences, etc. The problems are those of over-demand and role confusion rather than of underuse and distance between the research workers and the practitioners.

External dissemination to professional workers and scientific colleagues

A part of the original contract between the research staff and the organization was the understanding that the research staff was free to publish any findings that seemed to them to be of scientific importance. The dissemination of the materials to the broader field of professional workers was defined as a joint responsibility of the organization and the research staff.

Integration

As we have already indicated, there are problems of integration rather than of alienation. The research staff finds itself continually caught by conflicting loyalties to the goals and responsibilities of the research organization and the scientific discipline of which they are a part and the goals and program interests of the national youth serving organization to which they are related by the research contract. One of the problems is that organization B would like more time from the research personnel than they can afford in their budget, and the research staff feels motivated to put more time and energy into the project than is warranted by the size of the research budget. The direct influence they are having on the program goes far beyond the findings and interpretations deriving from the research activities. Much of it derives from the broader background of training in behavioral science theory as it is applied in informal consulting relationships.

General Comments and Questions about Utilization of Behavioral Science in these Two Cases

Inside versus Outside

One of the interesting areas for exploration seems to me to be an assessment of the advantages and disadvantages of having the behavioral science personnel located inside or outside the organization. There are plenty of successful and unsuccessful examples of both. Different problems are created by each situation.

When the behavioral scientists are outsiders (as in Case B) they have to demonstrate their readiness to understand and work on the problems of the client-system. The reciprocal "contract relationship" of the two parties seems to result in a more effective influence situation, and a motivation by the organization to "get their money's worth" by using the help that is provided.

When the behavioral science resources are located inside it is easier to be accepted as "one of us." But there often seems to be a problem of losing status as an expert resource.

Local Research or Wisdom from Elsewhere

Often the behavioral scientist has the judgment that the problems of a particular situation can be understood well enough to apply general principles from research done elsewhere, without the need for elaborate diagnostic research. Even if this is a current judgment it often seems necessary to do careful local fact finding to get psychological acceptance of the diagnosis as "really valid about us."

There are certainly some very tough methodological problems involved in trying to deal with the question of generalizing from research done elsewhere. Just how does one identify the degree of genotypic similarity of this situation and others? On what basis can one decide the degree of validity for this situation of theoretical principles developed from a sample of somewhat different situations?

Type and Degree of Compromise on "Level of Research"

The researcher may accept the value that there is nothing so practical (at least in the long run) as good theory, or basic research; but the action-oriented administrator or lay group is faced with decisions to make and action-sequences to take. A slight improvement in wisdom now is often more attractive than the prospect of more perfect wisdom at a later date. Usually some type of creative compromise is called for rather than a rigid expectation on the part of either party.

Periodic Evaluation versus Assessment of Causes of Movement

Too often the client and the behavioral scientist seem to be satisfied to get evidence of thedegree of success or failure of a given action effort, rather than to cope with the more arduous task of studying the processes which lead to one state of affairs or the other. This process analysis can usually yield much richer fruits of understanding the factors actually causing a successful or unsuccessful result of an action effort.

What Level of Communication is Required?

For some types of problems the verbal or written communication of a diagnostic insight or interpretation seems sufficient to lead to a corrective change in administrative action or new procedures or new structures. But in a larger number of cases cognitive insight is not enough to stimulate appropriate use. Frequently a much more intensive process of helping on the applying of the new knowledge is required, which may include collaboration in working out the implied lines of action. In both cases A and B the communication of the findings about successful leadership practice does not automatically result in improved leadership practice. Attitude changes and skill training are required to translate the new knowledge into actual changes that make a significant difference.

Behavioral Science Methodology may be the Significant Importation

In many situations, as in case B, the significant contribution from the behavioral sciences may be methodological, rather than substantive insights. This kind of building in of "feedback experiences" in the on-going action by the incorporation of modified research tools may have the most basic impact. In essence this amounts to the idea that training in the use of scientific values and methods of problem-solving may be the greatest contribution the behavioral sciences can make to any on-going human enterprise.

CASE STUDIES ON THE UTILIZATION OF BEHAVIORAL SCIENCE RESEARCH

By John C. Flanagan

Here are two more cases, one of which resulted in extensive utilization of research results, the other in more limited utilization. The author isolates some of the factors in these cases which might have made for the difference in amount of utilization. Dr. Flanagan is director of the American Institute for Research, in Pittsburgh, Pennsylvania.

Introduction

This discussion will report on two developmental studies in the behavioral science field which were similar in many ways but differ markedly in the extent to which the findings and procedures developed have been utilized. Both studies were carried out by the American Institute for Research and involved developing procedures for substituting somewhat more standardized and objective evaluation procedures for devices consisting primarily of sets of subjective ratings. Both studies represented applications of techniques used successfully in previous projects; both were based on the analysis of data collected from actual field operations; and both involved evaluative tryouts under field conditions of the procedures developed.

The plan is to provide an outline of each of the two projects describing especially those features which might conceivably influence the utilization of the results. These general accounts will be followed by a detailed comparison and analysis of

1. Background Factors
2. Factors related to the Nature of the Problem
3. Planning Factors
4. Factors related to the Initial Developmental Phase
5. Factors related to Tryout and Evaluation Phases
6. Timeliness Factors
7. Factors related to the Effects on the Decision-Makers
8. Factors related to the Effects on the Users
9. Factors related to Potential Benefits

The concluding section will summarize all aspects of the two studies which appear to have had an influence on the extent to which the results were utilized, and will develop generalizations to be stated as hypotheses regarding the factors which appear most important in determining such utilization.

An Example of Extensive Utilization of Results: The Development of an Evaluation Procedure for Hourly-Wage Employees

Problem

The methods used by foremen to evaluate hourly-wage workers did not provide satisfactory measures of performance. The types of subjective ratings usually used failed to discriminate the strong and weak factors in an individual's performance, or the better from the poorer employees. For a wide variety of purposes including training, promotion, assigning merit increases, and improving performance, a better system of evaluation was needed.

Background

This problem was discussed at a conference held by the General Motors Corporation in the summer of 1948. It was agreed that the Personnel Director of the Delco-Remy Division would work on the development of a satisfactory evaluation procedure. Accordingly, he appointed a committee composed of foremen and representatives of the personnel department. Several meetings of this group were held to discuss the problem and outline the requirements for a satisfactory procedure. In the spring of 1949, the Personnel Director and a representative of Personnel Services in the Corporation Headquarters attended a conference at the University of Chicago's Institute for Industrial Relations. They were favorably impressed with the ideas for developing an evaluation procedure presented by a representative of the American Institute for Research.

After the meeting further discussion led to an invitation to visit the Delco-Remy Division and discuss the problem with the committee. The committee thought the general approach outlined was promising, and a proposal for a joint project to be carried out by the committee and the American Institute for Research was formulated.

Plan

The objective of the project was stated to be the development of a practical procedure for use by foremen in evaluating the hourly-wage employees under their supervision. It was agreed that the end-product should provide as objective and factual a record as possible of the typical performance of the employee on the job. It was proposed that this record be based on the components of job performance found to be of most importance in terms of the goals of the organization. It was agreed that the recording procedure should be efficient and simple.

To develop such an evaluation procedure, critical incidents of unusually effective or ineffective performance were collected by the foremen and general foremen on the committee through interviews with other foremen in the Division. The procedures for collecting these incidents were developed by the representative of the American Institute for Research. He also provided instruction on the collection of incidents and checked the types of incidents obtained each day. During the first days of interviewing, the incidents collected were discussed with each interviewer. In addition to answering questions and making suggestions regarding the amount of detail provided by the incidents, the procedures themselves were revised to eliminate certain misunderstandings which some foremen had obtained.

In these interviews about 2500 critical incidents were collected. These were used to formulate the categories of a classification system. Various members of the staff contributed to the inductive development of this system. The types of behavior or performance in the classification system were listed on a form called the Performance Record with specific sub-categories indicating effective and ineffective performance on some important aspect of the job.

From the outset, it had been planned that the procedure provide an objective and factual record of on-the-job performance rather than subjective ratings and estimates of future performance. It was not known how frequently the critical incidents would need to be recorded to obtain a relatively complete record of important happenings. Similarly, information was not available on the feasibility of a system which required the foremen to observe, identify, classify, and record incidents of this type.

An experimental tryout was arranged in which four groups of 25 foremen each used the Performance Record in somewhat different ways for a period of two weeks. One group recorded incidents daily on each of five men working under their supervision. A second group recorded only at the end of each week. A third group recorded at the end of the two-week period. The fourth group were allowed to select their own recording procedure based on their experience as they tried out the method.

Results

The results, shown in Figure 1, indicate that foremen who recorded only once a week forgot at least half of the incidents they observed judging by the numbers for those recording daily. The foremen who recorded only at the end of the two-week period had only one-fourth as many incidents as the daily recorders. The group allowed to select their own recording procedure indicated that they found recording daily or oftener was the best procedure for them. Their results tended to be quite similar to those for the group recording incidents on a daily basis.

At the end of the study the foremen were asked to indicate their preference regarding frequency of recording. All but one of the 100 foremen participating in the experiment voted for daily recording. After seeing the results in terms of numbers of incidents, this one foreman also voted for daily recording.

Following this study all of the approximately 1000 foremen in the Delco-Remy Division were trained in the use of the procedure. The Personnel Director reported that during the first year the Performance Record was in use the number of disciplinary cases was reduced by 50 per cent. The procedure was adopted in a number of the other divisions of the General Motors Corporation in the years following its development.

Similar Performance Records were developed for non-supervisory salaried employees, and for supervisors and foremen. In the fall of 1955, six years after the initial developmental work, the Performance Record was made available for general use through publication by Science Research Associates.

NUMBER OF CRITICAL INCIDENTS RECORDED
IN A TWO-WEEK PERIOD ACCORDING TO
FREQUENCY OF RECORDING FOR GROUPS OF 24 FOREMEN EACH

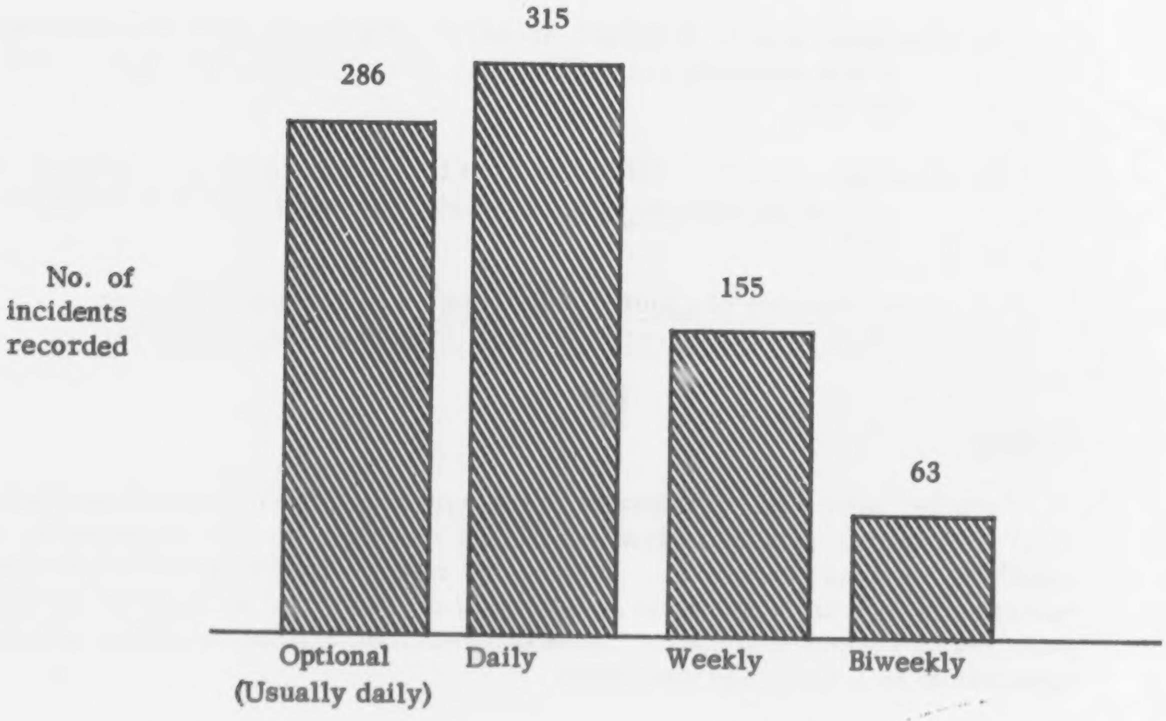

Figure 1

Publications regarding the procedures and results include the following:

1. Miller, Robert B. & Flanagan, John C. The performance record: An objective merit-rating procedure for industry. Amer. Psychologist, 1950, 5, 331-332. (Abstract)

2. Flanagan, John C. Principles and procedures in evaluating performance. Personnel, 1952, 28, 373-386.

3. Flanagan, John C. The critical incident technique. Psych. Bull., 1954, 51, 327-358.

4. Flanagan, John C. & Burns, Robert K. The employe Performance Record: A new appraisal and development tool. Harvard Bus. Rev., 1955, 33, 95-102.

5. Flanagan, John C. & Miller, Robert B. The Performance Record: The critical incident method. Chicago: Science Research Associates. 1955.

An Example of Limited Utilization: The Development of an Objective Proficiency Check for Private Pilot Certification

Problem

Studies over a ten-year period of the grades assigned pilots by instructors and Civil Aeronautics Administration examiners revealed serious inadequacies in the reliability of these procedures. It was also common knowledge that there was wide variation in both the content and standards of the flight test as used for certification purposes by various examiners. An improved flight test for certifying private pilots appeared to be a very important need.

Background

The Director of the Division of Research of the Civil Aeronautics Administration had sponsored a series of projects studying flight testing procedures at all levels of proficiency. These studies covering a ten-year period had developed a large body of facts and technical know-how regarding the measurement of flight performance. A series of studies initiated by the Director of the Division of Research of the CAA through the Committee on Aviation Psychology of the National Research Council and carried out by the American Institute for Research had resulted in the development of an objective flight check for certification for the airline transport rating. Early in 1949 the American Institute for Research proposed the application of similar analytical and developmental techniques to the problem of developing an objective proficiency check for private pilot certification. The program planning staff of the Civil Aeronautics Administration concurred in the desirability of such a developmental project, and provided the funds for this study.

Plan

The purpose of the project was the development of an objective flight check to improve the measurement and evaluation of the critical skills necessary for safe and efficient private flying. It was agreed that the flight check to be recommended for use in the certification of pilots for private flying would consist of measures of the private pilot skills which careful analysis revealed to be critical for safe flight. It was also agreed that the objective flight check would emphasize the principles established as essential to effective measurement by previous studies. These included: 1) uniform standards, 2) on-the-spot recordings, 3) efficient description, 4) objective items, 5) clearly defined tasks, 6) consistent measurement, and 7) critical components.

From the outset, the importance of using the experience and suggestions of a wide variety of groups was recognized. Throughout the project periodic planning conferences were held. These conferences were attended by representatives of the CAA's Safety and Certification Divisions, the Aircraft Owners and Pilots Association, and other organizations with research experience in this field, along with the professional research staff of the project and the Director of Research of the American Institute for Research.

The general plan for carrying out the project was to determine the critical components of safe flight as revealed by a systematic analysis of all the accident reports of private pilots for the year 1947. Special attention was given to those 1563 accidents of private pilots resulting in fatal or serious injury to personnel or in total destruction of the aircraft. Using the results of this analysis and the guiding principles for the development of an objective flight check as determined in previous studies, a tentative draft of the objective proficiency check for private pilot certification was developed. In addition to the review of the advisory group mentioned above, interviews and informal tryouts of the tentative form of the flight check were conducted in several states by the project director. More than thirty persons reviewed the tentative form and many of them tried out this new flight check in the air. As a final procedure for obtaining more extensive participation in the development of the form by the ultimate users, copies of this experimental flight check, a manual of instructions and a short questionnaire were mailed to two groups. The first group consisted of the 200 Airman Safety Agents in all regions. The forms were mailed directly to them by the Airman Division of the CAA. These safety agents are the persons responsible for the supervision of private pilot training and certification. The second group, the Aircraft Owners and Pilots Association also mailed these materials to 200 members of their Association. The persons included in their mailing represented those known to be especially interested in and qualified to evaluate the new flight check.

Of the 400 questionnaires mailed out, 90 were returned. These replies were used in preparing final recommendations regarding the flight check as presented to the CAA.

In addition to a number of informal tryouts of the new flight check it was possible to arrange a more formal study involving 25 student pilots tested at the 20- and 40-hour levels at the Institute of Aviation, University of Illinois.

Results

The objective flight check scores showed a fair degree of consistency between these two checks, whereas the subjective check pilot scores showed practically no consistency. Similarly, the objective flight check score at the 20-hour level provided a fairly good prediction of what the instructor grade would be at the 40-hour level, whereas the subjective check pilot score which was similar to the type of flight test evaluation then in use for certification showed only slightly better than chance predictive value for the same criterion. These data are shown graphically in Figure 2.

The analysis of the 90 replies to the questionnaire indicated that about eight out of nine of the respondents felt that an objective type certification check was desirable, and favored further development work toward this aim.

The project led to a similar developmental study for the U.S. Air Force. In this case the principle purpose was to develop an objective flight check which would predict later performance in military pilot training from a check given after only 20 or 30 hours of instruction in light planes.

A number of copies of the flight check proposed for use in the certification of private pilots were printed and turned over to the CAA in May 1951 at the time the final report on the project was published. However, it was the opinion of the personnel in the Airman Division of the CAA that the flight check was too complicated for use in the field and it was not adopted.

Approximately a year later new personnel in the CAA were given the responsibility for improving the flight check for the certification of private pilots. They prepared a new flight check incorporating a number of the principles included in the form devised by the American Institute for Research. Two very important factors incorporated into this new procedure were 1) stressing critical situations in flying and procedures for coping with them, and 2) providing specific tolerances in terms of numbers of degrees, feet, and miles per hour. In a conversation in February 1956, the official currently responsible for certification procedures indicated that he felt that the basic ideas had been put into effect and the CAA had received many complimentary remarks on the increased precision of their statement of critical pilot skills required for certification. He reported that he was still having trouble getting his field agents to apply the flight check in a standard manner. He also added that a revision of the examining manual was now in preparation, based on a new set of requirements being developed in cooperation with the Civil Aeronautics Board.

The only publication resulting from this project was: Stanford C. Ericksen, Development of an objective proficiency check for private pilot certification. Washington, D.C.: Civil Aeronautics Administration Program Planning Staff. Report No. 95. 1951.

A Comparison of the Factors in these Studies which Might Influence Utilization of Results

Background Factors

There appears to be one important difference in the backgrounds of these two studies. The study on which there was extensive utilization of results was initiated by

COMPARISON OF PREDICTIONS AS TO ABOVE AVERAGE INSTRUCTOR GRADE BASED ON SIMILAR DATA FROM THE 20-HOUR OBJECTIVE FLIGHT-CHECK SCORE AND THE 20-HOUR SUBJECTIVE PILOT SCORE

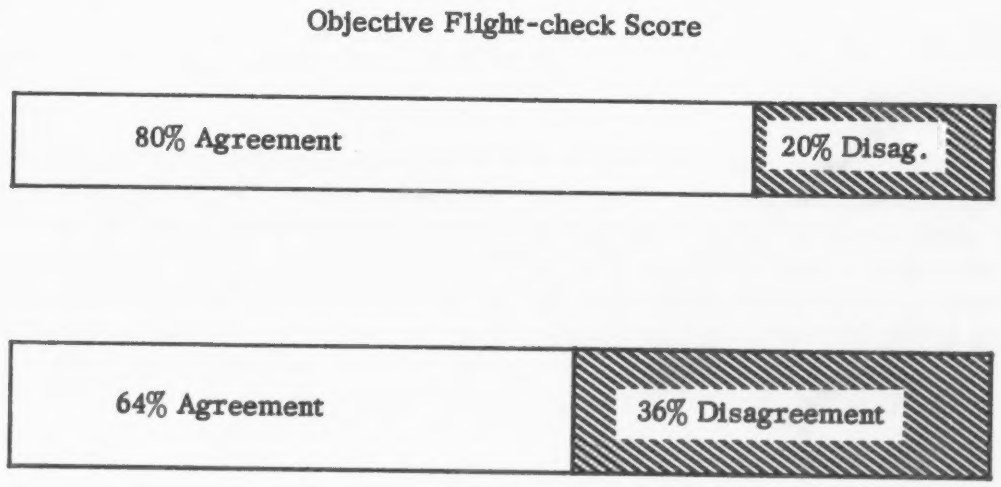

Figure 2

the person responsible for the type of procedure involved. This individual was already on record to the effect that the procedure in current use was unsatisfactory. He had also agreed to develop a new procedure as a model for general use. This decision was at least in part suggested to him by his superior who also felt that a change was necessary.

On the other hand, in the study in which only limited utilization has been achieved, the initiative came from the research personnel. The person responsible for adopting the new procedure was not under any pressure to make a change and apparently had no strong feelings that the current procedures were unsatisfactory.

Factors related to the Nature of the Problem

The two cases seem quite similar from the point of view of the nature of the problem involved. In both cases there appeared to be a real need for a precise, efficient, and objective instrument to replace current subjective rating procedures in practical use.

Planning Factors

In both cases extensive and probably effective use was made of advisory committees in the planning phases. However, representation on the committees was undoubtedly much more adequate in the project where good utilization was obtained since all of the personnel involved were concentrated in one location. This made it easy to bring together a group representative of all potential users. On the other hand, only the headquarters supervisors represented those who were the ultimate users where only limited utilization was achieved. In this case the actual users were spread throughout the country and adequate representation on the planning committee did not appear feasible.

Factors related to the Initial Developmental Phase

In both cases the instruments developed for use were based on systematic analyses of the factors found critical in recent operational experience. However, in the project on which more extensive use of the results was achieved, the ultimate users participated actively in contributing to and collecting the data. They reported critical incidents which they had observed recently and their representatives reviewed the analysis and classification of these incidents. In the project on which only limited utilization was obtained the critical factors were collected from the accident files and it was possible to obtain a review of the analysis and classification of these critical components by the headquarters advisory group only.

Factors related to Tryout and Evaluation Phases

Again in this phase, it was possible to obtain more general participation in the study on which more immediate and extensive utilization was made of the results. It should also be noted that the results of the tryouts and evaluation were probably much more effectively communicated to the users than in the limited utilization project.

However, it is of interest to note that the findings with respect to the value of the newly developed procedures were not more convincing in the high utilization project than in the limited utilization case. If anything, perhaps the reverse might be the case.

It is certainly true that these results were more immediately and effectively communicated to the prospective users in the high utilization case.

Timeliness Factors

From the general point of view of need for new instruments and availability of techniques for developing such instruments, it is believed that both of these studies were very timely. However, as previously indicated, in the case of the extensive utilization project, top management was sensitive to the need for an improved procedure, whereas in the other situation, there was no such sensitivity to the need at the time of the study.

Factors related to the Effects on the Decision-Makers

In both instances, adopting the new procedure represented some risk to the persons responsible for recommending such a change. There were two types of risk involved in each. First, the supervisors of those responsible for making the decisions might not regard the change as an improvement and hold the decision-maker responsible. And second, the users, or some vocal minority of them, might object to the change and cause some loss of prestige to the decision-maker. It should be noted that the field agents in the limited utilization project were probably in a stronger position to "make trouble" regarding a change than the foremen in the other situation.

Factors related to the Effects on the Users

It does not seem likely that there were important differences in the two studies in the real ultimate effect on the prestige and status of the users if the new procedures were adopted. However, it does appear that there were real differences in the perceived effects by at least some of the members of these groups. In the case of the high utilization study there was much emphasis in the presentation to the users of the increased opportunity to play an important role in developing employees. In the other study the field agents felt that the use of an objective procedure with fixed published standards would tend to mechanize their job and reduce its importance.

Factors related to Potential Benefits

In both studies substantial benefits appeared possible. It would seem that the direct monetary cost of obtaining these benefits was negligible in both instances. However, increased indirect costs in terms of time for recording observations would be required. In the case of the limited utilization study a potent, though largely irrelevant argument was that the requirement for more frequent recording represented a safety hazard.

In the project on which there was extensive utilization the potential benefits from adopting the new procedure included greater productivity and therefore greater profits, improved employee attitudes, and general improvements in administrative effectiveness. In the project on which there was only limited utilization of the results, the potential benefits were greater precision in evaluation leading to increased safety, changed emphasis in evaluation which should result in improved training and improved attitudes on the part of examinees because of the increased fairness of an objective examination. Perhaps the most significant difference in the two situations is that in one case the results in terms of productivity and better employee attitudes were more readily and tangibly evaluated than the potential benefits of increased safety and more favorable attitudes by examinees in the second study.

Summary

Comparisons could not be made in this study of certain factors which are probably important in determining utilization of research findings since they were included in both projects. These factors include: basing the research or development work on data collected from actual field operations; trying out the procedures developed under field conditions; selecting projects representing important needs; including in the planning phases those responsible for the ultimate decision to use the findings; and selecting projects for the conduct of which effective techniques are available.

The comparison does not seem to suggest that the conclusiveness of the evidence favoring the adoption of the new procedure is of very great importance. This appears unfortunate and it is hoped that it will become less apparent as the decision-makers obtain more sophistication in research methodology.

The comparison lends positive support to the importance of several factors in influencing the utilization of research results. These include: having the requirements for the study originate with the persons responsible for using the findings; having top management sensitive to the need for improvements in the area being studied; obtaining extensive participation of the ultimate users of the findings in collecting the data and evaluating the results; insuring that the decision-maker and also the ultimate users perceive the change as resulting in definite personal benefits to them; and having potential benefits from the utilization of the research findings which are tangible and readily evaluated.

Perhaps the most encouraging finding with respect to this comparison was the extent of use that had been made in the five years since its completion of the findings in the study originally selected as representing an example of extremely limited utilization of results. Perhaps researchers in the behavioral sciences field should devote their main attention to carrying out good research and seeing that the results are published and circulated to those responsible for making decisions.

THE APPLICATION OF SOCIAL RESEARCH FINDINGS

By Elmo C. Wilson

Out of his experience as president of International Research Associates, Inc., Dr. Wilson suggests some principles of successful utilization, and then examines a case in which the researchers followed up on a management study to find out which of their recommendations were accepted, which were rejected, and the apparent reasons why.

The Application of Social Research Findings

Much that is written and said regarding the utilization of research findings, in the social science field at any rate, appears to reflect a narrow view of the meaning of "use" and "useful". It is as though social researchers, obsessed with the need to justify themselves as scientific workers whose product repays the modest investment society makes in it, had to witness wheels turning and cogs meshing before they could be convinced that their efforts had had any effect.

Yet, a good deal of research which has been demonstrably useful has not been accompanied by specific recommendations or calls to action leading to corresponding acts and decisions. It has often happened, for example, that program evaluation research has simply shown that a program is being carried out as planned and that no modifications are called for. Such research was undeniably useful, although no one "used" it. Again, a piece of research such as the Census urges no program, suggests no revision of policy, proposes no innovations in practice. Nevertheless, the Census stands as a repository of information so useful and so heavily used that the chief criticism directed against it is that it is performed too infrequently.

This unfulfilled desire to push buttons and manipulate the machinery is probably keenest among those whose studies are classifiable as "pure" or theoretical. The rudimentary stage of development of the social sciences means that there is no cushion of tangible past achievements of the kind that permits natural scientists to pursue researches having no conceivable practical application, without ego-deprivation and with complete confidence in the worth of what they are doing. The judgments of their peers are sufficient criteria of merit for the natural scientist, but they still fall short in the case of the academic worker in behavioral science.

The same misgivings, if not of the same order of intensity, afflict the social science investigator in "applied research", including the multitude of commercial practitioners whose efforts serve business, industry and government. Here, however, the situation is different: research is sold or ordered, designed and executed in *use* context. It is assumed that it is to be used, else it would not have been undertaken at all. This state of affairs serves both to make more direct the researcher's stake in his product (since he has an immediate economic interest in its success) and to blur somewhat the specifying of criteria for usefulness; i.e., clients, too, must justify their investments (if only to themselves) and are under some pressure to make a showing of application of the findings for which they have paid.

At the same time, there is no generally accepted standard of what constitutes either the utility or the use of a set of research findings. Very often, the researcher's satisfaction in his work is based solely upon the warmth of the client's reception of the report. If it was "a mighty fine job" or "just what we wanted," the researcher is happy; if the reaction is lukewarm or clearly one of displeasure, he is unhappy; this, in spite of the fact that either reaction may occur without genuine relevance to the usefulness of the findings.

It is sometimes true, of course, that client-researcher collaboration in defining problems and formulating research procedures has been such that a pleased client reaction is reasonable assurance that the results are indeed useful; in such cases, the researcher is almost certain to know this without the client's confirmation. Where both researcher and client are in agreement as to the usability of findings, failure in fact to utilize them is virtually always due to circumstances which the researcher is powerless to modify: either the needs and goals of the client have changed in unpredictable ways, or extraneous forces (such as a legislature or a board of directors) have intervened to make utilization impossible.

Again, however, except in continuing research relationships such as those covered by a retainer arrangement, the researcher's knowledge of actual use of his work is generally sketchy, informal and inferential -- if it exists at all. He can seldom obtain comprehensive knowledge of the utilization of research except by a systematic follow-up, which may constitute another research in itself, requiring much the same procedures as were involved in the original study. (Partly because of their rarity, such follow-ups or reviews have considerable significance for the subject of this paper, and one such will be discussed in some detail later on.)

Conditions and circumstances which are beyond the conscious control of the researcher always bulk large, of course, among the factors entering into the ultimate disposition of a research report. Where these conditions are favorable, the research is likely to be well received and put to good use; where they are unfavorable, the most competent work, the greatest need and the best intent may not suffice to keep it from accumulating dust on the shelf. Frequently, the researcher knows or suspects that he is up against difficult odds even before he undertakes the study; even more often, he becomes aware of it in the course of the study. He may, of course, exercise the one measure of realistic control he unquestionably possesses: to decline the study or to discontinue it. While this is certainly advisable in some extreme cases, we may be sure that proposals will continue to be made, contracts accepted and research performed under all but the most impossibly adverse circumstances.

Although the researcher cannot modify certain of the factors which are going to affect the use of his work, it is nonetheless worthwhile to review a few of them here. To know them is at least to be forewarned, and there may arise occasions when sound application of the proper ingenuity or influence in the right quarters will help ease an otherwise hopeless situation. Case illustrations have not been provided in every instance; the same is true of the subsequent discussion of factors which are susceptible to the researcher's own operations in the interest of utilization.

Conditions the Researcher Does Not Control

The contracting agent and the point of application. A study's chances of being applied are improved if the proposal for it originates with the agency or division which it is to affect. The chances become progressively poorer as the originating authority becomes more remote from the point at which the recommendations are to be applied. Two closely parallel INRA studies can be cited as illustrations. In neither case was there any opportunity for the research organization to change in any way the situation within which the research was to be performed or its findings applied.

Each study was directed toward known or suspected deficiencies in the Reserve training set-up of one of the military services. Despite great differences in mission, mode of organization and traditions, the two Reserves shared so many common problems that there is no question as to their comparability for our purpose. Each, for example, was severely limited in the amount of time available for training. In each, a considerable portion of the limited training time was occupied with administrative routines and unanticipated or nonrecurrent duties. In each, the training was seriously compromised by a split between authority and responsibility, which were separately vested in two groups of supervisory personnel. Each was handicapped by a shortage of competent instructors and by deficiencies in their selection and preparation. The two studies were contemporaneous.

The research for Service Branch A was ordered by a service agency primarily concerned with developmental studies. The need of such an inquiry was not at issue, nor were cooperation and interest lacking among the operating personnel who served as subjects for the investigation. There was even general agreement that the problems defined for exploration were, in fact, areas needing corrective action. Nevertheless, the degree of follow-through on the recommendations growing out of the research was minimal.

The research for Service Branch B, although ordered by the same developmental service agency, originated within the operating organization of the Branch's Reserve arm. The problem areas were derived empirically from exploratory observation and from discussion between INRA and staff and Branch personnel, unlike the case with Service Branch A, whose problems had largely been set forth in advance as "given," with the research task restricted to a study of ways and means to solutions of problems thus predefined.

Quotations from introductory passages in the two reports are illuminating. They show how the predetermination of problems led to one kind of research focus with Service Branch A, to another kind with Service Branch B. In connection with the former, the study outline prepared by the contracting service agency states: "The first phase will define the areas *where existing problems interfere* with the accomplishment of training objectives (italics ours)." And later, in the words of the research staff: "Many of the problem areas are obvious. It is the task of this project to clarify and codify these obvious problems and to analyze the more obscure problem areas."

Definition of training problems contained little of the *a priori* element in the case of Service Branch B. "These problems have been established as a result of examining Reserve unit training operations in the light of their goals," states the B report, "no one was asked what his problems were . . . It should be noted that these problems have been developed from the *Reserve* point of view -- and that . . . where a possible solution is presented, this has been developed from the point of view of the Reserve, without knowledge or consideration of those policies and practices of the permanent establishment which might be involved."

This comparison, it may be emphasized, demonstrates the special advantage accruing to research which originates at or near the point of application: it is not so much that the egos of operating personnel are better served and the report thus launched in an atmosphere of greater good will, helpful as all this may be; it is rather that the very focus of the investigation itself is directed along more cogent lines. In both studies, the conclusions included short-range administrative prescriptions as well as recommendations for further study (both in-service and external) which was clearly indicated if the necessary action was to be soundly based. Inquiry over succeeding months established that few if any of the recommendations of Study A were carried out, whereas steps were shortly under way to effect many of the suggestions contained in Study B -- including the additional research called for.

A basis for choosing between opposing views. Other things being equal, research is likely to be functional in situations characterized by a sharp divergence of opinion as to the best of alternative decisions. This kind of situation sets up a framework within which the critical questions can be accurately formulated and inquiry directed with comparative precision. By the same token, the answers obtained are likely to be fairly clear-cut and the recommendations can thus more readily be stated in terms of the alternatives. It needs to be noted, however, that the phrase "other things being equal" is highly relevant; it means, simply, that the choice of alternatives is really understood to be dependent upon the results of the research. If, instead, the disagreement over alternatives is a reflection of political or bureaucratic contests, then the situation may be the worst possible for utilization of the research, no matter how well done. Unfortunately, the existence of such a state of affairs is often extremely hard for outsiders to detect, even after the research has been under way for some time.

Decision insurance. Research is often highly functional when substantial agreement has been reached on a policy decision, but the nature of the remaining opposition is such that disinterested outside testimony is needed to clinch the decision and produce an atmosphere decisively favorable to executing the policy. It is assumed in such instances that fair and impartial examination *will* in fact confirm the majority's conclusions; but, because it proceeds from sources not previously identified with the controversy, it will carry a weight which its proponents have lost in the course of debate. This is, of course, a quite different situation from that in which research is suborned to show a prescribed result; in the present case, should the results turn out other than expected, they would lead to indicated modifications in the prevailing views.

Such a situation evidently existed in the Department of the Army early in the Korean War with respect to the integration of white and colored troops. Opinion favorable to integration, chiefly on military grounds, had always been present in some strength; but under the stress of World War II experience with all-Negro units of divisional size and in response to strong political pressure, sentiment favoring implementation of Presidential no-discrimination orders had gained the ascendancy. If the Army circles in which the power of decision lay chose to do so, integration could be ordered forthwith, with reasonable certainty that it would work out satisfactorily.

The penalty of error, however, could be high; even were the prediction justified, it was possible that integration might carry a built-in source of failure if those responsible for effecting it down through the echelons should be unable to do so effectively because of their own unresolved doubts. In such a situation, impartial observers of integration already in effect could provide detailed and pertinent information as to its results. Project CLEAR, as this research was known, assessed the progress and effects of integration in combat units in Korea and in garrison units in the United States and concluded that it not only resulted in no damage to the performance of the affected units, but that it elevated the performance of Negro troops who were no longer segregated. Submission of the report on the Korean phase of the study was followed shortly by announcement of the policy of integration for all units in the Far East Command. The brevity of the time that elapsed between submission of the report and the policy announcement tended to support the belief that the decision had not waited to be formed by the report which was used as a kind of "decision insurance."

Filling an information vacuum. Where there is a complete or near-complete lack of information of a kind that makes an essential background for policy determinations, research providing the information will be highly useful. The number and distribution of radio sets, for example, in a country or an area for which this information has not yet been compiled is vital to certain kinds of promotion planning; even less-than-adequate research may find a patron in this situation, if there is nothing better available.

Systematic and projectable information regarding popular sentiment toward an American company operating in Brazil was needed for the company's calculations regarding its future investment and public relations programs in that country. No current source was capable of providing more than unreliable guesses. An INRA study was designed to obtain the needed information from a representative cross section of the country's adult population, and the conclusions of the study were then embodied in policies and programs designed to bolster weaknesses and exploit strengths in the company's position. While the study's results covered numerous aspects of the situation, almost any single aspect would have found some application under the circumstances.

Conditions Subject to the Researcher's Control

Competence of the research. In the foregoing, it was assumed that adequate levels of technical proficiency prevailed in the execution of the research. At this juncture, however, the matter should not be left implicit. In an unhappily large number of cases, studies are not used simply because they have been so poorly done that they possess no utility at all. This is, of course, par excellence the determinant of utilization for which the researcher assumes the responsibility. Clarity and sufficiency of formulations, efficiency of design, pertinence and effectiveness of instruments, skill and shrewdness of analysis, and economical management may not guarantee utilization of a piece of research; but there is no hope for it at all if they are lacking.

Proper definition of the problem. To say that a problem must be understood and

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defined before it can be researched is something of a first-grade maxim. What is often overlooked is that such definition may not be achievable until the client himself has come to a more adequate understanding of his needs. The researcher can frequently make major contributions to this understanding, assisting the client to think through his problems in terms both of logic and of susceptibility to investigation. Not uncommonly, the outcome of such a researcher-induced process is that the client comes to recognize a need totally different from the one he initially presented.

An interesting example of this within INRA experience involved a client's request for a study of reader reception of one of its house organs. A series of meetings between researchers and clients disclosed that the company's research problem was much broader than originally intimated. In the end a full-scale employee attitude study evolved from the discussions.

Setting realistic goals. Client disappointment with research is sometimes traceable to having entertained too high expectations of what research might be expected to accomplish. This is seldom a problem with clients who have had previous successful experience with research, but may be troublesome in other instances. The researcher may be reasonably sure that he can be of help, but that the help will be limited. To state the probable value of the research in the limited terms justified may, despite its accuracy, discourage the prospective client. The temptation to promise more than can be delivered is likely to be compounded by the knowledge that a less cautious competitor may get the contract.

Constructive management of this kind of situation is a function not only of ethics and the longer view, but, again, of research competence. If the researcher does not himself thoroughly understand the range of possibilities for his work, he is not in a position to explore them usefully with his client.

Identifying the client. The identity of the person or persons who will actually make the decisions regarding the usefulness of a study is sometimes a study in itself; it is usually well worth the effort it entails. Where the negotiating representative is to be the judge, or where no question arises as to the authority of his interpretation of the criteria, whoever the judges may be, this presents no problem. But there are frequent instances of research planned and conducted along lines which researcher and agent completely agree upon and which, upon submission of the report, are found to be wide of the mark set by the ultimate authorities. In order to avoid such outcomes, every effort should be made to ensure that there is no division of opinion between the negotiator and the ultimate authorities as to the purpose and expectations of the research. Where the latter's involvement in planning and monitoring can be obtained, there may be special advantages for utilization.

Follow-up on Utilization: A Case History

The remainder of this discussion is devoted to a report on an all-too-rare development; the follow-up by a research staff (in accordance with the original contract terms) of the progress made by the client in applying the findings of the study. The research involved was a management study of a small, denominational college. The objectives of the study were stated as follows in the preface to the original Report:

"This study is concerned with the actual and potential economic resources of___________ College; and with its policies, practices and plans in reference to these resources. Economic, as used here, includes all tangible and intangible assets of the college, excluding some matters of an academic nature. Thus the scope of the study ranges from financial matters, through personnel practices, to matters of community and alumni relations."

Detailed inquiry was made into such aspects of the college's management as the hiring, promotion, tenure and salaries of staff; the accounting systems and office procedures in the various divisions; fees and endowments; plant use and maintenance and the procurement of supplies; public relations and the recruitment of students. A firm of accountants served as consultants in the survey and analysis of the accounting and bookkeeping procedures.

As a result of the survey, more than 160 specific recommendations were made, of all degrees of importance. Nearly three-fifths of these recommendations either had been carried out or were in process of being carried out at the time of the return visit by the research staff, one year later. Major and minor recommendations had been carried out in substantially the same proportions in which they had been presented. Since the latter is a purely numerical finding, however, it should be kept in mind that failure to implement a given major finding may have more absolute importance than failure to implement twice the proportionate number of minor findings. In seven or eight instances, the research staff concluded that recommendations it had made originally were, in the light of further experience and additional evidence, not justified.

Reasons for Rejections of Recommendations

Of the 35 per cent of the recommendations which had not been effected, a little over half had been by-passed for reasons of bureaucratic inertia, for what may be termed "human relations" reasons, or for no ascertainable reason whatever. It is probable that many more than were so specified could be attributed to difficulties of personality and to entrenched personal preferences which had imposed effective blocks to change. This would be particularly true of relatively minor procedural recommendations, where failure to follow through would not be readily detected and, if detected, might not seem worth pressing for.

Not quite a quarter of the recommendations had definitely been rejected by the college officials on grounds which were usually made explicit. These were simply cases in which their judgment differed from that of the research staff. It was generally apparent that some ground for differing judgments did, in fact, exist; in most cases, however, the research staff remained of the same opinion as before with respect to the value of the recommendations. Again, there seems to have been no disproportionate representation of either major or minor recommendations in this group.

About the same number of recommendations as in the foregoing paragraph had not been instituted because their application was dependent upon developments beyond the scope of the study. Their general desirability was not questioned, but it was felt that they were contingent upon certain events of which the college authorities were hopeful but which they could do little or nothing to hasten. The research staff had been aware of these conditions, for the most part, at the time of rendering its report; since the recommendations themselves were deemed sound, however, they were nevertheless included.

Examples of Rejected Recommendations

A look at examples of these three types of nonapplied findings may be instructive. The illustrations are quoted from the Follow-up Survey and are presented in parallel columns for ease of comparison. The first set deals with cases in which the human element -- inertia, personality, and the like -- was judged to have been most influential.

The Recommendation:	The Result:
"The division heads should participate more fully in the budget-making process. Detailed budget requests should be required of each of the division heads prior to the adoption of the annual budget. . . . Once the budget has been approved, the actual spending of the money should be the responsibility of the division head rather than the Business Manager."	"The Dean of the College disagrees with the recommendation and has not given it his approval. Since the conditions which prompted it remain, further consideration of the matter by the College Administration is urged."
"It is suggested that one signature be required on general disbursement checks and that the practice of pre-signing checks be eliminated."	"The pre-signing of checks, a common procedure in the College, will very likely continue despite this recommendation. The Administration is urged to review again the recommended procedure."
"It is recommended that the two full-time dining department employees over 65 years of age be retired on their social security pensions and that the operation of the kitchen be continued without further re-hiring of full-time personnel."	"There is some evidence that personal reasons were permitted to intervene in establishing the most efficient system of help in the kitchen, and thus the anticipated saving of $3800 from retirement of personnel has not been fully realized."
"The Business Office could save time if expense allowances were paid once a month by check. Time could also be saved in preparing the weekly payroll if it were paid by check."	"This recommendation has not been carried out. If these expenses were paid by check, the Business Office would then probably have to cash them. However, the recommendation should ultimately be adopted because of its benefits."
"Endowment fund securities having a cost of over $400,000 have been kept in the Business Office safe for considerable periods. The securities would be better protected if they were kept in one of the bank safety deposit boxes."	"This recommendation has not been carried out, for no understandable reason. It is again urged that it be given immediate and serious consideration."

The second set of examples of rejected recommendations deals with those which the college administration had definitely decided, after consideration, to discard:

The Recommendation:	The Result:
"It is recommended that one Blanket Fire and Extended coverage policy be taken for all campus buildings and all endowment buildings owned by the College . . . . A blanket policy is more economical . . ."	"This recommendation has not been carried out. The coverage has been spread over several local companies for purposes of good will and the amounts have gradually been increased."
"Treasury Department Form 1099 has not been filed by the College for persons receiving expense allowances and wages amounting to $600 and over in a calendar year. This form should be filed to avoid the penalties provided for willful failure to make an information return."	"An informal opinion from a qualified source was sought locally by the College, and the advice given that adherence to this law was not absolutely necessary. Thus, the recommendation has not been carried out. While it is true that failure to file Form 1099 is more often overlooked than not in such cases, it should be clearly understood that the College is leaving itself liable for this failure to comply."
"It is recommended that the Director of Accounts review the advertising that is published in the Yearbook and compare the advertising space with the income received in the Business Office."	"This recommendation is being carried out wherever possible, but it should be pointed out that income from such advertising is frequently carried as a collectible item with no intention of pressing for the collection, in view of the needed good will of the advertisers."

As examples of recommendations considered to be contingent upon other developments, the following may be cited:

The Recommendation:	The Result:
"In view of the low utilization of real estate and the high costs disclosed in the cost analysis section, the Home Economics building should be converted into a rental property, and the value thereof added to the endowment of the College."	"This recommendation has not been carried out because the facility is relied upon to keep the student nurses' contract -- a source of income. The ultimate disposition of the Home Economics buildings will be up for consideration again upon the completion of the planned library, at which time the present administrative quarters will be available for expanded classroom activity."
"A revised Balance Sheet with four supporting schedules is recommended (Exhibit XVI)."	"Nothing has been accomplished on these recommendations relating to revising the financial statements of budgeting. It is evident that the subject will require discussion with the parent Board."

The Recommendation:	The Result:
"These records (prior years' accounting records) should be stored in a fireproof location instead of in the basement supply room of the Administration Building. Warehouse space could be rented, or a concrete vault constructed. . . . "	"This recommendation is being held up pending the construction of the library."

Conclusions From Rejected Recommendations

This recital of examples of recommendations which were not adopted, and of the reasons therefor, should help to illustrate two conclusions: first, that adoption or non-adoption seems to have been related but little, if at all, to the nature or importance of the recommendation; and second, that the validity of these recommendations is unimpaired regardless of the fact that they have not been carried out. Indeed, they would have merited inclusion in the Report even had the research staff been assured at the outset that there was no chance of their being put into effect. Their formulation was justified entirely without regard to their utilization or nonutilization: that the latter circumstance prevailed need not diminish the research staff's satisfaction with the work, even without the knowledge that the majority of the recommendations did get carried out.

Recommendations Put Into Effect

It may be noted that the following recommendations were among those put into effect:

The Recommendation:	The Result:
"Some saving in administrative effort might be realized by consolidating the Veterans' administrative functions with the Registrar's Office."	"This recommendation has been carried out, with a saving of $600."
"Increases should be made in the basic faculty pay scale whenever feasible, in order to bring the average compensation closer to that for College teachers as a whole."	"This recommendation, considered of vital importance by the Survey group, was carried out, with a raise of 10 per cent in the annual salary, plus a bonus of 7 per cent in the last school year."
"A basic pay scale should be set up in each of the four academic ranks providing an initial salary and annual increments for a period of three to seven years. If some range of bargaining is needed in hiring new personnel, they can be given one or two annual increments in addition to their base salary."	"This recommendation has been carried out."

The Recommendation:	The Result:
"It is recommended that the management contract with the ______________Company be terminated and that the Resident Manager be requested to terminate her employment with ______________ and become an employee of the College."	"This recommendation has been carried out. It should be noted that if anything, the excellent quality of the food in the dining-hall is even improved, rather than diminished. The minimum saving to the College through the cancellation of the management contract is $4200 per year."
"The Bookstore merchandising would be improved by the adoption of a line of the better grade paper-bound books. A display of the Mentor Book Series or the Anchor Book Series would be a probable source of additional income and would also add to the appearance of the Bookstore."	"This recommendation has been carried out."
"It is recommended that registration billing forms be prepared in duplicate on registration day."	"This recommendation has been carried out."
"Personal valuables are being kept in the Business Office safe. Since these items are not covered by insurance, it would be advisable to discontinue this practice to avoid liability to the owner in case of loss."	"This recommendation has been carried out."

Over-all Conclusions From Follow-up Report

The experience of the research staff in conducting the follow-up survey led it to certain conclusions of an over-all sort, in addition to those relating to specific items. A summary statement covering these conclusions notes that the success of the "key recommendation" -- raising faculty salaries -- was " . . . attributed to the influence of the Report by even the most Report-resistant members of the administration." The recommendation to drop the dining-hall management contract was found to be saving enough money, in one year, to pay for the College's share of the Report cost.

Some of the recorded comments of the College's administrators echo hypotheses presented earlier in this paper. To quote from the Follow-up Survey, "The value of the Report in the eyes of the various College administrators depends upon the viewpoint of the individual administrator. To some, ' . . . it strengthened my hand; I knew about this and your pointing it out gave me the backing to do something about it.' To others, it poses a threat, either appearing as personal criticism, or because it brings out into the open, for objective examination, conditions or working relations which have been accepted and not discussed. To still others, it is ' . . . really a guide for the future; we can work on this for a long time.' It doesn't matter that several administrators in the College characterize the analysis and recommendations by saying, 'Of course, most of these are things that we already knew about -- the Report just lays them out in front of us.' It does matter that the changes hadn't been made before the Report came out, and were made after it did come out."

In the opinion of the research staff, an even higher level of utilization might have been attained had certain weaknesses in the original Report been apparent at the time of its preparation. The research staff noted, for example, that "There is evidence that problems of a major nature were considerably attenuated by the inclusion in the Report of minor problems which though of value in themselves, were on a different level of importance." The presence of the minor matters was felt to have decreased somewhat the influence and effectiveness of the study; to say nothing of the contribution they made to the sheer bulk of the Report.

It was also concluded that the Report would have been more useful had it always made clear the comparative costs of the various recommendations, as well as the variable time periods within which it would be most desirable to bring them about.

As an encouragement to the Report's continued use as a kind of "blueprint for the future," the Follow-up Survey further suggested deletion from the body of the Report of a substantial Appendix and transfer of the summarized recommendations from the end of the Report to the beginning. In short, experience had again confirmed the value of brevity and a prominent position for salient material in achieving use of a research report.

It may be that this survey enjoyed an unusual advantage as concerns utilization, since the client knew in advance that there would be a follow-up to review the progress made as a result of the survey. The College administration thus had an added incentive to put the Report's recommendations into effect. This is a plausible observation and there is no reason why the device of a built-in review should not be worth considering for more studies in the future. The advantages to both client and researcher are so readily apparent that it should be possible to convince many more buyers of research that the review justifies the relatively modest additional cost.

The accumulation of broader evidence from a multiplication of similar instances would be of very great positive benefit to the purpose for which this paper was undertaken.

THE OCCUPATIONAL RESEARCH PROGRAM:
An Example of Research Utilization

By Carroll L. Shartle

This is a case of outstandingly successful utilization of social research. It is related by Dr. Shartle, who is Professor of Psychology and chairman of the Personnel Research Board at the Ohio State University. The case draws on his long connection with the occupational research program of the United States government.

At the request of William H. Stead, Associate Director of the United States Employment Service, the National Research Council and the Social Science Research Council in 1934 nominated members for a Technical Board (1) which was to give guidance to a newly established enterprise called the Occupational Research Program of the United States Employment Service. Initially the project was supported by foundation funds and later by Government appropriations. This Program and its successor organizations have developed concepts, facts, and scientific procedures which have had wide utilization in government, industry, and education.

It is the purpose of this paper to describe the Program with emphasis on the utilization of its research. Mention will be made of events, over the more than 20-year period, that appear to have been influential factors in utilization or lack of it.

Nature of the Program

Several publications have given an over-all description of the Occupational Research Program (2). The most extensive was prepared by William H. Stead and W. Earl Masincup in 1940. In 1944, Occupations, the official publication of the National Vocational Guidance Association, devoted an entire issue to a description of the first 10 years. No over-all description has appeared since 1944 although there have been technical articles.

The Occupational Research Program was established in the United States Employment Service, then a bureau in the Department of Labor. Its purposes included the development of authoritative information regarding occupations and jobs in the American economy and to discover the requirements for success in them. In early discussions of research plans and designs it was agreed that studies should be made at the source where jobs and workers were found. By 1944 over 25,000 industrial and business establishments and over 100,000 workers had cooperated in the research.

The principal research results of the ORP and its successor organizations are concepts, research methods, and research products. These will be illustrated before the techniques of utilization are discussed.

Concepts are perhaps most difficult to describe and yet they have far-reaching implications. For example, the concept of looking at the world of work in terms of families of occupations or constellations has received wide use in vocational counseling and training. No one can say who was first to propose the concept, but ORP gave it practical meaning and contributed substantially to its development, acceptance, and utilization. Also, the concept of the physical demands of jobs, developed in ORP, is now extensively applied in the counseling and placement of the physically handicapped.

The application of most any research product requires concepts which the user receives, in part, from the product itself. In counseling a job seeker, for example, the person trained in utilizing test scores has a different concept of the counselee and his role from that of the interviewer who knows nothing about tests.

In research methodology ORP contributed to methods in job analysis and statistical analysis which have been widely utilized by other research units. In some cases a method has been modified to the extent that it is now utilized as operating practice rather than as a research tool. Job analysis, for example, was pretty academic when the ORP began methodological studies. However, adaptations were made so that for many persons job analysis is no longer a research device but an essential operating method in personnel practice.

Research products of ORP are mostly occupational information publications of various kinds and standardized tests for measuring aptitudes and skills. They are listed herewith and briefly described.

Dictionary of Occupational Titles

Volume I was published in 1939; the second edition in 1949. It defines occupations and gives code numbers according to a classification structure. It contains 22,000 definitions and lists approximately 40,000 job titles alphabetically. Volume II also was first published in 1939, with a second edition in 1949. It presents the occupational classification structure by defined major groups, divisions, and subdivisions which bring related occupations together by the use of code numbers. Volumes I and II of the Dictionary are perhaps the most widely used occupational documents in the world. Their usage is standardized practice in public employment offices in the United States and Canada, the United States Armed Forces, and the Veterans Administration. They were used a great deal by industry during World War II in justifying occupational deferment. They also served as the basic document for determining and defining critical occupations. The code structure is used by many schools in arranging their occupational information files and libraries.

Part IV - Entry Occupational Classification. There was a preliminary edition in 1941 and a revised edition in 1944. It defines entry fields of work and lists occupations in those fields which are usually open to inexperienced persons. The classification structure was developed in terms of vocational interests, job family concepts, aptitudes, leisure time activities, casual work experience and vocational training. Usage is now required in public employment offices, Veterans Administration, and the Armed Forces.

Descriptions of occupations presented in bound volumes for 17 major industries

All were published in 1937 to 1939 except Grain and Feed Milling in 1945, Office Occupations in 1944, and Hospitals in 1952. Usage of these book type industrial job descriptions has been more in relation to plant-wide or industry-wide consideration than to individual occupations. Their use has been limited. The urgency of hospitals for personnel provided a need for the hospital descriptions.

Individual Job Descriptions

Individual booklet type job descriptions were published between 1943 and 1946 for over 100 occupations, particularly those important in war industries. They were superseded by occupational guides published for about 120 occupations during 1947-1948. These were booklet job descriptions with labor market information added. Individual job descriptions supplied a need, particularly during the War and reconversion, for information about particular occupations. They were made available to public employment offices, to many governmental agencies, and schools.

Job Families

Tables of related occupations were published in 1942 to 1944, particularly for occupations pertinent in the war effort. They were designed to aid in recruiting and transferring workers to war production occupations. They received considerable use during the War. Although the publications themselves are now little used, the concept has continued.

Aptitude Tests

Aptitude test batteries were standardized for about 150 occupations. Later a general aptitude test battery covering 20 broad fields of work was developed. These tests are used widely by public employment officers for counseling and placement of learners and persons without work experience.

Trade Tests

Standardized typing and stenographic tests and oral trade questions were developed for use in estimating the degree of skill possessed by experienced applicants. Oral trade tests originally received a good deal of use as interviewing and classification aids by public employment offices and by the Armed Forces. These are now out of date and little used. Typing and stenographic performance tests are applied in most larger public employment offices.

Occupational Composition Studies

These are reports showing the percentage of workers in various occupations in plants according to Dictionary terminology. They were extensively used as an aid in determining manpower requirements for war plants and in community manpower problems during the conversion after the War. They met a current need but have been little used since except in manpower requirements research and in planning job analysis studies.

Physical Demands Analyses

This is a method of analyzing jobs to determine the physical requirements and working conditions imposed upon the worker. Several volumes of descriptions of physical demands for jobs were published but the principal utilization of this concept and method has been by government and industry as an operating tool in selecting and utilizing workers, particularly those with physical handicaps.

Special Studies

A large number of special studies, special reports, and publications have been prepared to meet current problems. They have included information on occupations suitable for women, tables of civilian occupations related to military specialties, and definitions of critical occupations.

Climate of Need

The Occupational Research Program was begun in the depression when millions were unemployed. Almost any project which appeared to have a possibility of helping persons find jobs was looked upon with favor. The ORP was justified not as something that would create jobs but as an aid to finding out what the jobs were in industry and business. How could persons choose jobs, train for jobs, and find jobs if one did not know what they were? No list of jobs was available with descriptions, or even definitions. The census list of titles was available, but titles alone were insufficient and often misleading.

The climate of the depression thus gave the ORP a favorable over-all setting for its start. The new administration in the Federal Government in 1933 also produced an atmosphere for change and new developments.

The Wagner-Peyser Act in 1933 created a new United States Employment Service to facilitate the movement of unemployed workers to profitable employment, including provisions for occupational guidance for job seekers. It consisted of state administered public employment services affiliated with a federal bureau in the United States Department of Labor. The Bureau provided professionalized assistance and guidance in the over-all operation. There was also established an emergency organization called the National Reemployment Service (also operated by the United States Employment Service) for communities not covered by the various state systems. Soon local public employment offices were established throughout the country. The local offices provided a facility whereby unemployed workers could register for work and on the basis of their qualifications they could be referred to job openings in industry, business, agriculture and government. With the development of the Works Projects Administration and the Public Works Administration vast new job opportunities were created. As early as 1934 the offices of the United States Employment Service made 4.5 million placements in one month and had an active file of 8 million job seekers.

Several problem areas in the development of the Employment Services played a part in increasing the general necessity for utilizing the research materials produced by the ORP.

First, there was the necessity for statistical reporting to give answers to questions needed for both local and national planning and policy decisions. How many job seekers were there? What work programs should be planned to absorb the aptitudes and skills of the unemployed?

Second, there was a need for interviewing and counseling whereby the employment offices knew the aptitudes and skills of persons seeking work. Also, registered job seekers wished to know about job opportunities and how to get them. What were the opportunities in Chicago compared to Dallas or Los Angeles? Youthful applicants were particularly vocal for they had little or no experience to offer in a highly competitive market.

Problems of filing application cards came up. How should the cards in an office be classified so that employer orders for workers could be filled with the persons best qualified from among the thousands registered in a local office?

If an interviewer files application cards by occupation, what does it mean? A machinist to one person is like a tool and die maker; to another he is a machine operator. How does one register a youth who has no experience and will take "anything" that is open? What about the physically handicapped job seeker, or the older worker who may be very difficult to place? How does one advise the experienced worker who desires to change his occupation? These and many other similar problems were a challenging opportunity for occupational research.

Attitudes of Resistance

While one could conclude that the climate of the depression favored the development of the Occupational Research Program, there were forces that worked in the other direction.

With the exception of the Department of Agriculture, the Government was doing little research, especially in the behavioral sciences. Congressmen and many governmental administrators were skeptical of research. Some doubted that it was a proper governmental function; others felt that a "payoff" was dubious and many saw the pressure of getting a tough operating job done with limited funds and personnel and thus nothing to spare for research. At the same time, critics of the Roosevelt administration were already attacking many programs and expenditures as impractical and useless. Unemployed persons wanted jobs at once -- not research.

The Employment Service had relatively few professionally trained persons.

Interviewers in local offices came from all walks of life. Routine operations frequently ran behind schedule. Who would have time to use a dictionary of jobs if one were available?

Four Periods of Activity

The Occupational Research Program can be viewed as it reflected the world and national events from 1934 to 1955 (3).

The first was the depression period previously mentioned. The Program began July 1, 1934, and was conceived as a 5- or 10-year initial affair. The Technical Board was established, foundation support secured, and the job analysis studies were initiated which resulted in job descriptions published in book form for several industries. These were followed in 1939 by the completion of the first edition of the Dictionary of Occupational Titles. In 1935 the Worker Analysis Program was initiated for developing performance and oral trade tests and aptitude test batteries.

The research program grew rapidly from an initial grant by the Spelman Fund. Emergency funds from the National Reemployment Service and large grants from the Works Projects Administration for field centers brought the size to a staff of over 600 persons by 1937. In 1939 emergency funds were drastically reduced; the United States Employment Service was transferred to the Social Security Board. It became a division of the Bureau of Employment Security. It was necessary for the program to fit into the regional office set up by the Social Security Board. The headquarters staff of ORP, now called the Occupational Analysis Section, was reduced from nearly 200 to 50 for the fiscal year of 1940. Displaced staff members trained in occupational research transferred to operations, moved to other governmental agencies, or joined industry. Some were absorbed by state employment services to carry on studies of jobs to aid in local office operations.

The second period was World War II. A few months after the drastic reduction in the research staff, a need suddenly developed for studies of defense jobs and new war industries. Many former staff members returned to the program. The staff in Washington reached a peak of 300 in 1942, and the state employment services a little later had 750 persons trained in occupational research methods for studying jobs, aiding in manpower utilization and placement.

In 1943 the Occupational Analysis Section was transferred to the War Manpower Commission and became the Division of Occupational Analysis and Manning Tables of the Bureau of Manpower Utilization.

The postwar period can be described as one of limited but continuous research with considerable emphasis on the utilization of the research products in the state employment services. The former Division of Occupational Analysis and Manning Tables was separated into two principal parts each of which was added as a branch to a different main division. One branch is concerned with job analysis, occupational descriptions, and occupational classifications; and the other branch is responsible for research and assistance to the state services for testing activities.

Current research activities are principally the development of a new occupational classification procedure to replace the two systems now used, namely, the

Entry Occupational Classification and the Dictionary, Volumes I and II. Also, there is continued development of a general aptitude test battery which came into being after World War II. This battery is used in counseling and the norms are presented for families of occupations requiring similar abilities. It is also used in research as a "core" battery for developing more specific batteries for the selection of entry workers for specific job openings. Research is also being done on physical demands analysis methods. Nearly all research activities are being conducted in cooperation with state employment services. For example, ten states are cooperating in the development of the new classification system and 20 states are cooperating in test validation studies.

Factors in Utilization

We have briefly described the products and the development of the Occupational Research Program and its successor organizations. We have mentioned the climate of need which existed and the major organizational changes that have occurred over a 21-year period. We shall now proceed with a discussion of a number of events which were directly related to the use of the research results.

Dual Responsibilities of the Researcher

The Technical Board of the Occupational Research Program at the onset stated that the project should be concerned with both research and application. This was a very significant policy decision, for it meant that those in responsible positions in the Program had two missions. This is in contrast with what is perhaps the more usual pattern where one group deals with research only and some other administrative unit deals with application only.

In the latter arrangement, if the product is not utilized, the researcher can disclaim responsibility and report that the product is not being applied correctly. On the other hand, the unit responsible for utilization may report that lack of use is the fault of the researcher who supplied an inappropriate product in the first place.

Giving a research unit responsibility for both development and application has its disadvantages. In the first place, the researcher may feel restricted in his research work and he may not explore some worthwhile avenues because he doubts if there will be a practical payoff. Also, some of our best researchers are not interested in application and may not wish to be associated with a program that has this dual emphasis. In large projects, however, some "pure" researchers can be employed for basic studies that contribute to an over-all product which is the responsibility of someone else. For example, in the Occupational Research Program there were research methodology problems and questions of theory that did not require the individual researcher to weigh the criterion of practical use. His chief, however, saw the basic research as a specific contribution to an eventual usable product.

When a researcher is responsible for utilization, he has a difficult problem. Since he is not a part of operations and does not have authority to make people use his product, he must function in other ways.

Experimental Application

In the ORP several methods were applied. First of all, experimental centers were established in several selected cities in cooperation with local employment offices. Here new materials could be introduced in an operating situation and the results observed and evaluated. The District of Columbia Employment Center was also used for this purpose. The experimental center approach also simplified communications, for the scientists in Washington could communicate directly with the Center in regard to both research and utilization rather than pass through the official channels of a Washington bureau and a state employment agency. The director of the field center and most of the staff were on the ORP payroll. The director and his group had to function with considerable tact in order to maintain the close cooperative relationship with the local office and keep the good will of the particular state employment service. The experimental field centers were given publicity and were discussed at meetings of state employment service directors. The work became well known and served as an icebreaker for the more extensive use of the products..

Assistance by Technicians

Funds to maintain the field centers indefinitely were not available and as the centers were closed, a second type of utilization emerged. This was technical assistance and was sometimes called infiltration. Research and utilization oriented personnel on the payroll of the ORP became involved in the state agencies for the purpose of assisting them in using or adapting for use the materials produced by the research. The development of local job information for placement and counseling and gradual introduction of testing procedures in offices received impetus by this method. All was voluntary on the part of the state agency.

The states with the better operations were given preference. For example, early in the program a state employment service director might request the typing and stenographic tests developed by the ORP. The request would be discussed with the field operations staff in Washington. If the state agency appeared to have its quality of operations in good standing, arrangements would be made to send a qualified person on the ORP payroll from Washington or one of the remaining field research units to the state. The technician would explain the implications and requirements for installing typing and stenographic tests in local offices. The necessity of having a trained person to give the tests, the suitable space and equipment required, the training of interviewers and counselors in interpreting the scores and the implications for applicant and employer relations would be discussed in detail. If it appeared that the introduction of the materials had a reasonable expectation of success, one local office was chosen for the first trial. It was usually one of the larger offices. The technician would work with the office for a week or more in assisting the management in the introduction of the tests and their use. When the technician felt the operation could be carried on successfully without him, he would report back to the state headquarters. Perhaps they wished tests in other offices but the technician would persuade the director to hold off until they saw how the new procedures worked out in the first office. During this visit, the technician would, no doubt, explain how the use of ORP products was working out in other states and what other useful ORP materials would be available. The Washington visitor played a definitely subordinate role, emphasizing that he wished only to give helpful technical assistance and was not concerned with other issues. This was necessary in order to avoid his being drawn into controversial policy or budget matters that often boiled over between state agencies and the Bureau in Washington. The role also aided in building a reputation that the ORP technicians were helpful persons who knew their business, stayed out of administrative affairs, and would remain in a state long enough to accomplish something.

Occupational Analyst's Role

With further extended visits and with the expansion of the use of research materials in the offices of state agencies, it became apparent that a full-time technician (later called occupational analyst) was needed. The friendly visitor from ORP was perhaps offered the position. If he accepted, the problem was settled for the time being. If he did not accept, he probably worked with the person selected locally who might also be sent later to Washington for further training. With a state occupational analyst on the job it became apparent, as the work of offices became more professional, that one or more were needed in each larger local office. Soon the title, Occupational Analyst, appeared as a budget item. In addition, there were also interviewers and counselors who worked part time as occupational analysts.

The analyst aided in the use and adaptation of the research materials and undertook local studies to provide occupational information for the local offices. Later they participated in the standardization of aptitude test batteries in cooperation with ORP personnel in Washington. During World War II they worked extensively on problems of manpower utilization in war plants and on a variety of other emergency problems where the research materials or research skills were needed.

Many occupational analysts were placed in regional offices of the War Manpower Commission to give assistance. After the War, the analysts in the field were limited to those in the state agencies where they now continue.

It is no easy matter for an occupational analyst to perform his tasks successfully. Since he is a technician without administrative authority, he must be able to persuade administrative personnel to accept and retain his ideas. While he must be technically competent, the chances are that if he fails, it will be because of interpersonal relations rather than lack of technical competence. He needs to be effective in teaching individuals and small groups, and be able to follow through with persistence until the user of the research product has developed sufficient skill. He needs the social skills that will result in quick and continued acceptance by the local group with whom he works.

The ORP during its first 10 years of existence received sufficient favorable attention so that many of its staff were drawn off by industry. The practice in the Program in such instances was to aid the occupational analyst in getting well situated rather than to drop interest in him when he was about to take an industrial position. Turnover was high at times, but in terms of wider utilization of ORP concepts, methods, and materials the practice was no doubt helpful. Most of the analysts went into personnel work and some now have major executive positions in business and industry. Others joined consulting firms where their competencies were useful. A number are teachers in colleges and universities.

Utilization in the Armed Forces

Perhaps the most dramatic example of utilization was in the Armed Forces. This was initiated largely through interpersonal communications in Washington. In 1936 an Army major (who later became a four star general) quietly visited ORP. He indicated that in case of emergency ORP methods and materials would be needed in the classification and assignment of military personnel. Three years later, the major returned. The Army needed badly to analyze its jobs in order to develop equitable levels of pay. ORP enlarged its program and made 10,000 job analyses in the Army. The resulting materials were used in many ways but never for determining pay levels as originally intended. The Army, and later the Navy, developed occupational research work of their own. In nearly all cases the original staff who developed these personnel who had learned their methods in ORP. They were either lent or had been transferred to the Armed Forces. If the analyst did not receive a commission and was drafted, a note was promptly sent to the Adjutant General of the Army so that the draftee could be spotted for later assignment in occupational research work.

So extensively were former ORP personnel found in business, industry, education, government and the armed forces that they became known as "alumni." Their effectiveness as utilizers of ORP concepts, methods, and material varied with the situation. However, the results of the infiltration approach seem to justify it as a method to increase utilization.

Participation by Administrative Personnel

The ORP, while originally made up primarily of professional persons with technical backgrounds, also included persons whose bent was more in the direction of administration. This aided in utilization and also in the strictly research phases of the Program because many of these persons, after a year or two with the Program, moved into responsible administrative and fiscal positions. Their experience in most cases had convinced them of the importance of the research and its potential value in the operating picture. They were thus able in many cases to facilitate wise utilization by making administrative decisions that persons in ORP were not in a position to render. To turn down a state director who was adamant for materials that his agency was not yet competent to use, or to insist on higher quality in operating standards and personnel were valuable administrative decisions to aid utilization. Likewise, the approving of occupational analysts in state agency budgets and insistence on their being well trained were very helpful to utilization. This administrative support did not by any means all come from administrators who had formerly worked in ORP, but it is believed that such persons made a significant contribution to utilization. Likewise, local office and other state employment service personnel who received training in and/or experience with occupational research products were later helpful in both research and utilization, particularly when they were promoted or transferred to positions of greater influence. Several served in important positions in the Bureau of the Budget of the Federal Government; one became assistant to the President of the United States; another became a dynamic United States Senator.

An influential person can, of course, make for trouble. One prominent candidate for high office announced over nationwide radio that all copies of the Dictionary should be burned. He was objecting to the unemployment compensation law in his state where the Dictionary was and still is used as an aid in determining what is suitable work for an unemployed person who applies for benefits.

Formal Training

While the earlier use of ORP materials was aided by more informal methods, formal training programs played an ever-increasing role in utilization. As state agencies developed, programs for in-service training of their personnel and the use of ORP materials became a part of such training programs. Occupational analysts aided in developing the content of programs. They often did part of the teaching and, occasionally, an analyst was appointed the director of training.

There were, of course, special training programs when a new procedure or product was to be introduced for general use. The most extensive special training program occurred when the first edition of the Dictionary of Occupational Titles was introduced into all local offices in 1940. A small group of carefully selected persons from the field worked with the Washington staff in preparing the program. This kind of participation was important so that practical operating procedures and needs in local offices could be fused with the technical knowledge that was necessary to understand and apply the Dictionary classification structure with its definitions of nearly 20,000 separate jobs or occupations. The necessary training sessions with teaching aids and practical exercises were prepared in detail. The original group trained key persons who in turn trained others until within six months nearly 10,000 persons had participated in the sessions. This special program was later modified and adopted by the state agencies as a phase of their regular personnel training procedure.

One phase of training that has been popular is to give training in job analysis to local office personnel, particularly interviewers and counselors. The concept and method are taught and then the trainees attempt to analyze one or more jobs and prepare a description of each. This seems to create a greatly improved awareness of what a job really is and tends to increase the use of occupational information by the trainees in their work. Checks indicate that the professional quality of work with applicants and employers increases after taking such training.

Another method to increase utilization is to have a newly employed interviewer initially attempt to use the Dictionary and other materials without training. This can be a frustrating experience, but one which creates a strong desire to learn about the use of the materials.

Formal training in the use of the Dictionary and other materials as a part of the procedure in the classification and assignment of military personnel was inaugurated by all the Armed Forces. During the War, colleges cooperated in giving this training to officer candidates. Since then, the training has been done by the Armed Forces themselves.

The Veterans Administration and other civilian agencies which use the Dictionary as a part of their procedure have developed training programs.

The local public employment offices in many communities have given training to school counselors and to representatives of business and industry.

Concepts, methods, and products of ORP are now taught in courses for counselors and personnel workers in at least fifty universities and colleges.

An example of an agency without a training program was Selective Service. Six thousand copies of the Dictionary went to the local selective service boards during the War. Although no systematic check was made, very little proper use was observed; in fact, in one office it was reported that Volume I of the Dictionary was regularly used as a doorstop. At this same time many schools wished copies of the Dictionary but had difficulty obtaining them. One professional journal suggested that the local school visit the nearest selective service board and ask for a long-time loan of the board's Dictionary. This was a successful venture in a number of cases.

Required Use

One of the most effective means to insure utilization of materials produced by behavioral science research is to require their use and to give credit for such use. This does not insure effective application and sometimes a usage will be required which is unnecessary. For example, in some of the early counseling procedures developed by the Veterans Administration the use of the Dictionary was required in a detail beyond what was necessary. This was later modified. Too great detail in application is apt to force the user to become over involved with product and procedure and lose sight of the real purpose of his task.

Required use is no doubt the reason why the Dictionary of Occupational Titles is so widely applied.

Credit for use is also important. In public employment offices a report is given concerning the number of applicants given aptitude test batteries. Such activity is a part of the work load and a local office thus receives official credit for such testing. On the other hand, oral trade tests, which also have optional use, receive no official credit. This may be another reason why oral trade tests by comparison receive little attention.

Format and Content

A research product, such as a job description, a dictionary definition, or an aptitude test may be developed by using the best research techniques, but unless it is continually available in a usable form, its application will be limited.

For example, in ORP several volumes of job descriptions were prepared on an industrial basis. It turned out that for interviewing and counseling they were awkward to use. They were later supplemented by booklet type descriptions which could be filed handily in the top drawer of a desk. These were much more popular.

Some apparatus tests were installed in local offices that had parts that were easily lost and difficult to procure. These tests were replaced later by ones whose parts were easily attainable at a hardware store.

One apparatus test required several minutes of the test administrator's time to set it up after an applicant had finished. This test was replaced by a similar type that was always "ready to go" when an applicant finished. In fact, the second part of the test was getting it back in order. The original apparatus tests were designed for individual administration. By a modification of scoring method they became suitable for group testing.

The first edition of the Dictionary of Occupational Titles had an arrangement of definitions whereby the interviewer often found cross references difficult to find. This was greatly simplified in the second edition.

During the War and later, it was necessary to issue supplements to the Dictionary which contained definitions of new jobs. At first, a loose leaf binder was supplied to each user. All the interviewer had to do every few months was to take out obsolete pages and add the new ones. However, this proved to be a detailed task that often did not get done. New pages would arrive before the previous batch had been installed. The loose leaf arrangement was replaced by sending out a completely revised supplement each time on cheap paper. All the interviewer did then was to throw the old one in the wastebasket.

Most of the ORP products have had fairly high "face validity"; that is, they looked useful and made sense to the applier. While this initial impression is important for utilization, it is of course better to have a product that wears well. Occasionally, the initial impression of a product was negative. For example, a Congressman at an appropriations hearing stated that Webster's Dictionary looked better to him and he thought the Dictionary of Occupational Titles should be discontinued.

It is important that the content be utilized in terms of what it is designed to do. In many instances the Dictionary and other products have been improperly utilized because they looked more useful than they were. The Dictionary has been brought into labor disputes and other controversies as authoritative evidence when the information it supplied was not suitable for the purpose of either side. Some people, unfortunately, think the Dictionary represents work standards; and, therefore, it should be used for this purpose. This idea persists in spite of a special notice in the front of each copy of the Dictionary indicating that it does not represent standards.

A dictionary definition is necessarily a general one and is not intended to describe a specific job in a given locality. It must be supplemented by local descriptions. On the other hand, a local job description is not intended to cover jobs in general.

Another distinct factor in utilization is to have the proper content. If material is too lengthy, it will not be read; if it is too short, it does not contribute enough to be worthwhile. If the applier finds factual errors, or thinks he has found them, his attitudes may defeat the whole purpose. The new user of the Dictionary will invariably check on the merit of the entire publication by looking up the definition of his own occupation or a job with which he believes he is familiar. Some users lost faith in the published job families because some of the related jobs seemed farfetched and perhaps were. Interviewers in Los Angeles found a few answers in one of the trade tests that did not apply to their community. This was bad enough but made worse when it was discovered that the western validation data came from San Francisco.

Because of incomplete coverage, some Dictionary definitions were defective as were other products. Occupational research materials quickly become out of date and must be continually revised. Unless this is done, any such research products will soon fall into disrepute with the users.

Conclusion

In this paper an attempt has been made to discuss the utilization of behavioral science research materials that were developed by the Occupational Research Program and its successor organizations in the United States Employment Service.

Mention was made of the products which include the Dictionary of Occupational Titles, Job Descriptions, Job Families, Oral Trade Tests and Aptitude Test Batteries.

Factors in utilization were presented. These included: (1) giving the research person definite and official responsibility for utilization; (2) developing informal relationships with operating people and filtering technical personnel and products into the operating offices; (3) research participation by lay persons who later aided utilization; (4) formal training programs; (5) requiring utilization as a part of standard operations; and (6) the importance of format and content of product.

Methods have been discussed much more than standards of utilization. How much utilization is necessary, for example, to justify a research product? In a very large operation, such as the 1,500 public employment offices, it is logical to assume that a research product may be worthwhile if it is utilized in only a portion of the offices. During the War, it was assumed that job families were worth developing if they were used in only a few of the more important offices. On the other hand, it is necessary for all offices to use the Dictionary of Occupational Titles if labor market information is to have validity and if applicants in one locality are to be placed in jobs at distant points.

Quality of utilization is likewise important but difficult to obtain. Surveys and spot checks can be made. In ORP one unpublished study showed that 50% of the classifications of applicants would have been different if the oral trade tests had not been used. Many reports have been received showing that the quality of placements improved when certain research materials were properly applied. A recent survey in one local office showed that after tests and local job information were properly utilized, placements increased nearly 1000% and the percentage of persons hired from those referred rose from 39 to 63.

There is a real need for careful research in determining the relative utilization value of occupational research products. Such research should be considered a standard phase of the utilization process.

Notes and Bibliography

1. During the first phase of ORP, 1934-1940, the following persons were members of the Technical Board:

    J. Walter Dietz, Chairman
    William H. Stead, Executive Secretary
    Paul S. Achilles
    W. W. Alexander
    Ismar Baruch
    W. V. Bingham
    Ewan Clague
    C. L. Dedrick
    Frederic A. Delano
    Meredith B. Givens
    William Haber
    Clark L. Hull
    Harry J. Jager
    Edwin A. Lee
    Isador Lubin
    Stanley B. Mathewson
    L. J. O'Rourke
    Donald G. Paterson
    A. T. Poffenberger
    B. C. Seiple
    Thomas C. Spates
    Bryce M. Stewart
    M. R. Trabue
    Morris S. Viteles
    George F. Zook

    In 1940 the Technical Board was reorganized and reduced in size. New members included: Marion Hedges, Ralph Hetzel, Millicent Pond, Leonard C. Stoll and Carroll L. Shartle (Secretary). The Board was discontinued in 1946. Since that time, advice and guidance have been obtained from committees of the Advisory Council of the Bureau of Employment Security and from consultant groups called together to deal with specific problems.

2. Although there are over 100 technical articles reporting phases of the work of ORP and its successor groups, the three most extensive descriptions were published in 1940, 1941, and 1944. They are:

    Stead, William H., Carroll L. Shartle, and Associates. *Occupational Counseling Techniques*. New York: American Book Company, 1940.

    Research methodology and results are shown for oral trade questions, rating scales, criterion development, statistical analysis, aptitude test batteries and occupational relationships.

    Stead, William H. and W. Earl Masincup. *The Occupational Research Program of the United States Employment Service*. Chicago: Public Administration Service, 1941.

    A report to the Technical Board covering the Program through 1939. The development of the Program is described including organization chart and sources of funds. The Spelman Fund, the National Occupational Conference, and the American Youth Commission supplied $273,000. The Federal Government granted about two million dollars. Products are listed and details given, particularly about job analysis and job descriptions.

Shartle, Carroll L., Beatrice J. Dvorak, Carl A. Heinz, et al., "Ten Years of Occupational Research, 1934-1944," Occupations, 1944, Vol. 22, No. 7, pp. 387-446.

> The principal products are described largely in terms of the methods used in their development. A bibliography of 110 items is listed including both government publications and articles in professional journals.

3. The ORP from 1934 to 1939 was under the direction of William H. Stead with M. R. Trabue serving as Technical Director for the first two years. The Occupational Analysis Section and its successor organization, the Division of Occupational Analysis and Manning Tables, were under the direction of Carroll L. Shartle from 1939 to 1944, and under Carl A. Heinz from 1944 to 1949, when the program was divided. The two principal activities are now in the Testing Branch under Beatrice J. Dvorak, which is a part of the Division of Counseling, Selective Placement, and Testing under Earl T. Kline; and the Occupational Branch under Walter S. Studdiford, which is a part of the Division of Placement under Carl A. Heinz. Both Divisions are in the Bureau of Employment Security, United States Department of Labor, Washington.

THE COMMUNICATION AND UTILIZATION OF THE RESULTS OF AGRICULTURAL RESEARCH BY AMERICAN FARMERS: A Case History 1900-1950

By M. L. Wilson

One of the most impressive examples of the utilization of scientific research has been the progress of agriculture in this country since 1900. Believing that this development may have some relevance to a better understanding of the problem of utilizing behavioral science, we have asked Mr. M. L. Wilson to analyze briefly the development of "utilization" in American agriculture.

Mr. Wilson is one of the great figures in American agriculture and was for many years head of the U. S. Cooperative Extension Service. He is retired and is at the moment in India on a mission directed toward improving the utilization of knowledge of scientific agriculture in that country.

His account, reproduced in the following pages, is full of implications for behavioral scientists. We have not thought it necessary to point out these implications, but the reader will note that the ball was set rolling by a research discovery of great value and dramatic result in meeting a recognized need. There followed demonstrations of this and other research results. Word of these demonstrations was carried by word of mouth. Ingratiating names were found for the new practices. Organizations began to grow up around this process -- agriculture colleges for training applied scientists and professional middlemen; organizations such as the cooperative extension service or the "county agent" plan devoted directly to utilization. Around these grew up a broad spectrum of agricultural media and special services to agriculture, all tied together by the source of their information (the land grant colleges and USDA) and the source of their trained "appliers" (the colleges of agriculture).

One of the impressive elements in the pattern Mr. Wilson draws is, despite the extent and complexity of this system of utilization, the farmer's carefully nurtured sense of identification with the system -- it is "our" service. Interesting too is his candid statement that it takes ten years to get new knowledge into practice and even after that time the percentage of adoptions is often discouraging.

INTRODUCTION

In an address before a group of agricultural students at Iowa State College in 1905, Professor K. L. Hatch, Assistant to the Dean of the College of Agriculture, University of Wisconsin, said that "The principal problem of the College of Agriculture, University of Wisconsin, now is getting the useful information to the farmers of Wisconsin which exists on the college campus, partially as a result of recent research work in the experiment station. We have developed the Babcock Test to determine the butter fat in milk, whereby farmers can sort out their low producing 'boarder cows,' we know how to test dairy cattle for tuberculosis, how to feed dairy cattle with rations that will produce more milk at cheaper cost. We have a new variety of corn, Wisconsin No. 7, which will yield 10 bushels per acre over the ordinary varieties that are now grown in southern Wisconsin. We have a lot of other things as well that we are ready to teach, and as research develops, we will have more and more that have practical application to our farmers, but we don't have any clear-cut and effective way of getting these facts understood and used by farmers." He went on to say that President Van Hise of Wisconsin University, who was held in very high esteem by Theodore Roosevelt, because of his leadership and statesmanlike interest in the conservation of natural resources, frequently stated that the campus of the College of Agriculture of the University of Wisconsin was different from the campuses of the other colleges, in that it included on it all of the farms and the farm families of the state of Wisconsin. Every farmer and his family and his farm were part of, or included in, the classrooms and the laboratories. Mr. Hatch continued to explain that their work now consisted of research in the experiment stations and teaching students in the classrooms and the laboratories, but this was not enough. Their responsibility and their service to the state required that they teach the farmers as well. He held out his thumb and first two fingers, pointing them downward, and continued, "We must have a tripod, one leg of which is the agriculture experiment station, a second leg is the College of Agriculture, and the third leg is yet to be added. This is the leg that will deal with reaching and teaching the farmers of the state. We have not decided yet the best way to do it or what to call it, but we have reached the point where some means must be found."

This memorandum, in a brief and sketchy manner, will outline what has happened in the development of the third service outlined by Professor Hatch. The problem was, perhaps, a little more complicated than was thought to be the case at the turn of the century. The use of research results by farmers was not simply a matter of making it easily available to them -- it involved a process of growth and development in the farmer himself, a series of steps, so to speak, with cumulating changes in his outlook and personality and behavior. There was to be an inter-action between the farmers as users of research results and the publicly supported institutions of the state and Federal Government who supplied the research. This inter-action produced changes in both. As the flow of research results took place, the pattern of behavior, the pattern of ideas, the forms of research and teaching agencies, and the systems of prestige in the rural communities, changed very perceptibly. Farming is carried on largely as an individual family enterprise. The farmer and the family make their own decisions. The farmer is a manual laborer, a technician and user of scientific knowledge, a farm manager, an individual enterpriser, an engineer, and a citizen all combined. In this respect he is different from many of those who live in cities and work in industry in which a high degree of specialization has developed, and in which the decisions about the use of research results and of changed methods of production are made by few people. It is important to understand the institutions that have grown up in agriculture to perform the functions of education, of training for professional technical service, as well as the passing of research results on to farmers. During the last fifty years, the Land Grant Colleges and the U. S. Department of Agriculture, as institutions of state and national government, have developed to perform certain functions and supply certain services to farmers that are somewhat unique and their counterpart does not exist in the other segment of American culture. It is for this reason that this memorandum takes the form of a case history.

This memorandum will first deal briefly with the technical and idealogical revolutions of agriculture, next with the development of the colleges of agriculture, the agriculture experiment stations, the agriculture extension service, and the special programs of the Federal Government, as these functions are related to changes in the technology of agriculture and the behavior of farmers themselves. The other institutions and forces closely related to or supplemental and parallel to the public functions, but which are non-governmental in character, but nevertheless important channels in reaching farmers, will be surveyed and discussed. The final section will deal with process of communication as it goes on today. This communication deals with those kinds of ideas and knowledge which are desired by farmers and their families as agricultural producers, and as members of the rural community in which they live, and as citizens of the world at large.

The writer of this memorandum asks the indulgence of the reader in connection with several personal references. He has had the good fortune of being in the midst of much of the development described herewith. In 1902, he entered the agricultural course at Iowa State College, and as a student assistant took part in the second two-week winter short course for farmers given at Ames in the winter of 1902-3. He was the first "county agent" in Montana (1912), and has been involved in extension work ever since. At the time of writing this memorandum, he is preparing to go to India on a special mission as consultant to the Indian Government in connection with the development of rural village extension teaching (The Community Development Program - Multi-Purpose Village Level Workers - to which the Indian Government has made a commitment and set forth goals to the end that there will be a village extension agent working in each five villages within the next 7-1/2 years). This program calls for the training of 100,000 village extension workers.

1. THE TECHNICAL AND SCIENTIFIC REVOLUTION IN AGRICULTURE

It would be like carrying "coals to Newcastle" to spend much time dealing with the great scientific and technological changes which have grown out of scientific research, and which have produced the great transformation in all walks of life during the past fifty years. It is generally recognized that the speed with which these changes are taking place is increasing all the time. We live in a very dynamic age. The changes in farming are a part of the present era and the changes have been just as great, perhaps no greater, than in other fields of technology. The attitudes, the ideas, and behavior of farmers have, in my judgment, changed just as much or more as the technology, the machines, the methods under which agricultural production is carried on today.

In the early summer of 1902, my father and I, a boy of 16 years of age, met Mr. Peter Hopley on Main Street of our county seat town, Atlantic, Iowa. Mr. Hopley was an Englishman, who purchased about a thousand acres of the best river bottom land in Cass County, Iowa shortly after the Civil War. He probably had more prestige than any other farmer in Cass County. He was a tall, stately, fine looking man with a gray mustache and spoke with a good deal of assurance and authority. As farmers went, he was quite successful, often feeding as many as 500 steers per year. He was an importer of Shire and Clydesdale stallions. My father frequently visited with him, and next to the banker, held his judgment in farming matters very high.

During the conversation, Mr. Hopley said, "Well, Mr. Wilson, your youngest boy is getting up where he can be some good to you - a regular hand on the farm." To which my father replied,. "Yes, but I'm going to send him to the Agricultural College at Ames this Fall."

Mr. Hopley straightened up with surprise and said, "Mr. Wilson, I'm surprised. It's alright to send some of the boys to college, but why would you want to send him to an agricultural college? Send him somewhere to study something that would have a future. Get him off the farm. I have spent my life here in Cass County. I am not worth much more now than I was when I came here 35 years ago. There is nothing to farming but drudgery and hard work. Then, besides, there is nothing to that 'book farming' at the agricultural college. It is entirely impractical." "Why," he went on to say, "I went up there to see Professor Curtiss to try to sell him a Shire stallion. He was sitting in an office finer than any in Cass County. He had on a white shirt, a better suit of clothes than you or I ever had, and just think of it, he's Professor of Agriculture, runs a farm from a soft office chair, and the taxpayers pay for it. He took me to the cattle barn where they were feeding some experimental steers. The barn had fly screens on the windows to keep out the flies, and they have gunny sacks as fly nets over the steers. Mr. Wilson, that's the biggest waste of the taxpayer's money that I know about. It's nothing but farming out of the book. You are a good farmer. If you want this boy to succeed you on your farm, keep him right at home with his hands on the handles of the corn cultivator. You know a lot more about practical farming than Professor Curtiss at Ames."

My father immediately changed the conversation to the price of feeder steers. Nevertheless, Mr. Hopley expressed the thoughts of perhaps most of the farmers in Iowa at that time. There were then, perhaps, 20% of the farmers of Iowa who read Wallace's Farmer, the Orange Judd Farmer, the Breeders' Gazette, and whose attitude toward Ames might have been mildly friendly, but to most farmers, it was book farming.

Almost fifty years afterwards to a month, I was in the office of the Dean of Agriculture of Iowa State College, having been invited to attend the meeting of the State Agricultural Advisory Committee to the College of Agriculture, the Experiment Station and the Extension Service. This committee meets each year. The members of the committee are rotated and consist of a farmer and a farm woman from each congressional district. They are actual working farmers or farm homemakers. The committee each year comes to the college, spends two or three days meeting with the faculty and staff, then they spend a half day in executive session at which time they write their report. This report is given at a college staff luncheon. Dean Floyd Andre came into his reception room, where I was waiting, and said to me, "You'll have to be a little patient, because I have a committee representing the hog producers that are coming in in a few minutes. They are in a very critical mood. We have been conducting some experiments in feeding antibiotics to sows and pigs. The results were startling; so much so that we do not feel justified in releasing them until we have duplicated the experiments and have, for that matter, the results verified by other Experiment Stations. Some of the results have leaked and this committee is here to demand that the results be immediately made available. They say, you're a state institution, you're supported by the taxpayer, you've got information that means dollars and cents to the hog industry. Why don't you give it to us now?"

When the advisory committee reported, the chairman said that the committee recognized the truth in the statement made by the Dean to the effect that the standing of the college is such in the state of Iowa that if the college gave out research results, large numbers of Iowa farmers would immediately act on this information. The college, he said, had a reputation and a standing to preserve, and that they did not dare release certain kinds of information until it was fully verified by the most exact scientific standards.

These two illustrations serve well to illustrate the great contrast of fifty years, and this memorandum will deal with some aspects of how this change has taken place. I would not want the reader to infer that there is no time lag in agriculture now between the research results and their adoption, or that farmers are constantly waiting on the doorstep of the Experiment Stations. However, institutions and channels of communication have been developed between agricultural research and the farmers as the users of the results of research that are unique in our society.

Before we proceed further, there are two points that I should like to clear up a little for the reader. One of these is the use of the word "farmer." It is not a very precise word, and we recognize all kinds of variations in types of farmers in the United States. The concept "average farmer" is an abstraction and does not exist in reality. What may be called the "commercial farmers" of the country are said to produce 90% of the total agricultural production which passes through the channels of trade and distribution. There are large numbers of part-time farmers, who live on the land and perhaps do some farming, and while they are part of the rural community, often times they are by no means interested in using "the latest results of research." Some of the research work of the state experiment stations and the U. S. Department of Agriculture in both agriculture and home economics brings forth results which bear directly on home life and family living of all farmers, regardless of whether they are commercial or part-time, or subsistence farmers. The research and extension program in Home Economics which deals with food preservation and preparation, human nutrition, child care, family life, clothing the family, home beautification, labor saving in the kitchen, etc. are all part of this story. Parenthetically, when reference is made in this memorandum to agriculture, by implication home economics is also included. The two are inseparably related in agricultural research and program making.

Everyone is a creature of his home environment, and as a child he develops in his mind stereotypes which he carries with him throughout his life. I was born in a community of corn belt farmers where the farms ranged from quarter to half sections in size. Therefore, instinctively when I am talking about farmers, I am actually thinking about the kind of farmers and farm families that live on the farms that you look down upon when you fly over the Corn Belt. I, therefore, caution the reader that most of the general statements which use the term "farmer" are susceptible to refinement and more precise definition.

There is a "consciousness of kind" that tends to run through the total agricultural economy in the United States, and in a way ties the professional workers and the specialized activities, wherever they may be, to the great body of farmers and rural people in the United States. Agricultural and farm life and living is something that the individual is largely born into. There is only limited migration from the city or non-agricultural walks of life into farming. The current of migration since the beginning of cities, of specialized functions in society, and of modern industrial civilization, has all been away from farming. As the specialized services, about which I have a good deal to say in this memorandum, developed, they drew their personnel pretty largely from "farm families." By and large, but of course with many exceptions, the students at the colleges of agriculture and to a lesser degree of home economics, come from farms and rural communities. As the professional people developed as college teachers, as researchers in agriculture, and as extension workers and vocational high school teachers, there was no psychological gulf between them and the farmers to whom they rendered their services. During the first half of the 50 year period which I am discussing, farmers might be critical of the "agricultural college man" in the abstract, but when the farmer visited with him, or attended his meetings, the farmer likened him to his own son or daughter or the younger generation of neighboring farmers. This lack of any social or psychological gulf between the people in professional agriculture and working farmers is very important. One does not realize the full significance of this until he steps into many of the other cultures of the world, where the students in the agricultural colleges come from the upper classes in the city. In many of these cultures there is no opportunity for the son of a peasant farmer to become an extension worker or a professor in the college of agriculture. In these cultures it is easy to observe a wide gulf and difference in attitude between the peasant and the agriculturally educated man. The professors in agricultural colleges in the United States and the researchers in the experiment stations feel a sort of moral responsibility for keeping in close touch with the farmers of their state, and as a consequence the "head of the horticultural department" in an apple growing state will be acquainted with most of the apple growers. In the course of a year he will have face to face contact, either through meetings or personal conversations, with most of the apple growers.

This guild-like social structure in American rural society is now changing. It is not nearly as tight as it was a few years ago. Today, it is possible for a "city-bred" man to enter the field of professional agriculture without prejudice on the part of today's modern farmers.

2. NEW METHODS AND CHANGING FARMERS' ATTITUDES

This memorandum is not so much concerned with the history of the progress of agricultural research as such in the first half of the century, as it is with how the application of this research has changed the personality, the pattern of ideas, and the behavior of the farmers who used it. Their culture, so to speak, has changed. Certain ideas have dropped out of the pattern and have been replaced by others which have grown out of science. There is an inter-action here which over the past fifty years has produced great personality changes. These changes, it seems to me, are greater in psychological terms than have been the changes in production in economic terms. If we had some way of measuring it, this psychological change would prove greater than the physical change stated in terms of man-hours, dollar farm income, etc. The thinking of the farmers who were sitting on Dean Andre's doorstep was vastly different from Peter Hopley's thinking fifty years ago.

I can illustrate what I am trying to say by taking an example which is typical of the technological change in agriculture which we are discussing. Let us take the story of hog production from 1900 to 1950 as an example.

There had been little or no change in the methods of raising hogs in the Corn Belt from the time the virgin prairie lands were broken until the discovery of hog cholera and the development of a vaccine at a joint U.S.D.A.-Iowa Experiment Station laboratory near Ames about 1907. Up to that time, good farmers and hog raisers had certain skills which the English called "husbandry" in dealing with their hogs. But, regardless of these skills, it was to be expected that once every three to five years an epidemic of hog cholera would sweep along and kill 90% of the farmers' hogs within a few days. There were many theories about what caused hog cholera. Mr. Hopley, I expect, was pretty positive in his ideas as to what caused it. My father thought that if growing pigs had free access to wood ashes and copperas, they were not apt to have the cholera. But, none of these things made any difference. When the epidemic came, it swept across the country like a great storm and paid no respects to any farmer. It was sometimes justified as a blessing in disguise, for since the hog was a prolific animal, its numbers would soon outrun the demand, if it were not for the cholera, and farmers would be afflicted with over-production, mounting surplus, and low prices. It was said, therefore, to be nature's regulator of production. The vaccination was a simple process, particularly if done by a veterinarian, and for a cost of fifty cents per pig the cholera was stopped in its tracks. There was no extension service when this great innovation came into hog raising. However, the extension service soon came into being, and the county agents in corn-hog counties were quick to develop with the farmers a hog "cholera free county program." The vaccine was associated in the farmers' minds as having been developed by the Iowa Agricultural College. It was a boost for all of the Mid-Western agricultural colleges. The farmers called it the agricultural college vaccine. This, of course, was in the days before public relations. In later times, business concerns would be willing to pay millions of dollars to get the good will and favorable attitude which the cholera vaccine gave to the colleges of agriculture and the U. S. Department of Agriculture. There were no more epidemics of hog cholera. This pushed the prestige of the corn belt colleges of agriculture skyward in one big thrust, but it did not solve all of the problems of raising pigs.

Even the best of hog farmers had wormy pigs and increasing numbers of runts. Now that hogs could be raised without the danger of loss by cholera, the farmer who used to raise 100 head now raised 250 head. He was more prosperous, and one of the first things he did was to build an expensive hog house with a maximum amount of skylights, etc. He did not realize that increasing the number of hogs on a farm, and concentrating them in barnyards, and having the pigs farrowed year after year in the same unsanitary pens, was building up terrific sources for the infection of the little pigs with intestinal parasites.

Dean Mumford of the University of Illinois recognized this problem and set up a research team including thereon veterinarians, animal husbandrymen, zoologists, agronomists, agricultural engineers and farm management specialists. A system of yards was worked out so that the sows and pigs were taken out of the old barnyard. New, individual small farrowing houses were built so that they could be moved about with great ease. Under the new system, the doors of the expensive hog house were nailed shut and the pigs were farrowed in a clean environment in which they were not infected. As a consequence, the worm-free pigs utilized their feed with 20% greater efficiency than the wormy pigs.

After proving this out on the experiment station, it was next taken to McLean County, Illinois, where it was set up as a pilot plan on a county-wide basis under the direction of the county agriculture agent. Extension meetings were held to explain to farmers the why-fors and general supervision was given the project by the college. It was tremendously successful. It was one of those kinds of projects in which communication takes place a little in advance of the time schedule. Other hog farmers hearing about the project, and county agents in other counties, began to go to Bloomington to see it in action. It was named, nobody knows by whom or when, "The McLean County System of Hog Sanitation." It is doubtful that any advertising agency or public relations advisor could have selected a better name for the corn belt. McLean County was widely known for its fertile corn land, for the Funks' seed farm, for the generally high state of corn, and its hog agriculture. Bloomington, the County Seat, was another good name.

Most of the other experiment stations in the corn belt had been working on the worm problem, and had been giving recommendations about the same as those that were involved in the McLean County System. But, they had not set it up as a pilot project, and they did not dramatize their work as did "McLean County." At any rate, in less than three years almost every county agent in the corn belt of the United States had a major project dealing with raising worm-free pigs. There was magic in the name "McLean County System." It was the terminology that was largely used in Iowa, even though it was the product of another experiment station.

The "McLean County System" had five steps in it. It was not a simple thing like vaccinating hogs for cholera.

First, the use of the old hog house was discontinued and new, small, individual farrowing houses were used instead.

Second, the sows were moved out of the old "pig pen" and farrowed in a new alfalfa field or meadow which had not been used as a hog lot.

Third, the udders of the sows were disinfected before the newborn pigs suckled.

Fourth, clean pure water in clean troughs was made available -- no more drinking out of infected mud holes.

Fifth, the feed troughs were kept clean.

This required farm management, the control of several factors, and an understanding by the farmer as to why each one of these steps was necessary. Many farmers would not take the care and trouble to follow all of the five steps. Those who did were rewarded with worm-free pigs, but those who followed the two main points of moving the sows on to new ground with clean water and feed troughs did about as well as those who followed the complete system.

In the late twenties, the extension service in Nebraska decided to try an experiment in introducing the McLean County System into a township about 75 miles west of Lincoln. They first held a series of meetings in this township, in which the system was completely explained. After this, personal visits were made to each farm in the township and the whole thing was explained individually to the farmer. At the end of the year, the township was re-surveyed, and it was found that about 25% of the farmers were practicing all of the five steps. About 35% or 40% were practicing the two main steps, and, as I remember, 10% were not practicing any of the steps but intended to start the coming year. All of the farmers who practiced the system were satisfied. There were 25% who did not make any change and did not seem to be interested. They were frequently old people, or those who had one or two sows, or whose personalities were such that they didn't adjust or change their habits under the kind of stimuli offered by this educational campaign. If I am not mistaken, a survey was again made in this township about five years later, and the investigators found that the new practices were now part of the habits, customs, and routine of raising pigs for better than half of the farmers. Everybody was for it -- no one was against it. The farmers evidenced much good will toward the University of Nebraska, and the interviewers usually wound up their interviews with a discussion of some problems about corn, the price of hogs, or something of that nature. At any rate, the extension people estimated that it took about ten years to build these practices into the habits and customs of the corn belt farmers.

My point is that the introduction of the "McLean County System" was made much easier, since it came after the first step which eliminated hog cholera. It would have been much more difficult if there had been no hog cholera vaccine discovery.

By the middle thirties, the use of vegetable oils for shortening in cooking had created a serious problem in connection with the consumption of lard and the raising of lard-type hogs. The science of genetics in relation to "hog type" had been developing in practically all of the experiment stations types of hogs which gave high quality carcasses, lower percentage of lard, earlier maturity, and more pigs per litter. Within four or five years, during the thirties, there was a remarkable shift from the old lard-type to the new type hog. This change was not as marked nor as spectacular as far as the beginning point was concerned as either the use of the cholera vaccine or the adoption of the McLean County System. It could not have quite the same direct demonstration approach. Yet, it marked the third step in the change of hog production, and was much easier to make because of the farmers' changed attitudes as a result of the previous steps and the other recommendations on hog raising from the colleges and experiment stations.

During the forties, considerable fundamental research in relation to animal nutrition was going on at the experiment stations. This research was uncovering new facts relative to hog rations and the place of minerals, vitamins, proteins, etc. in their diet. Someone in concocting some poultry rations thought of the idea of putting penicillin in the ration to protect the chicks from scours. To this investigator's surprise, it not only prevented a disastrous diarrhea in young chicks, but they gained more rapidly, were free from disease, and made much more efficient use of their feed. In about 1950 or 1951, some of the experiment station workers in the field of animal nutrition said to themselves, "If it works with chicks, maybe it will work with scours in pigs." It did, and the information got out by word of mouth, and that was why the committee of hog producers was on Dean Andre's doorstep.

The story of practically every line of agriculture production follows the pattern that I have described in reference to hogs. It is the same story with dairy production, poultry production, control of insects and plant diseases, application of fertilizers, pasture management, farm power, labor-saving farm machinery, and many of the processes in the home as well.

If a graphic analysis were made of perhaps 50 or 75 of the most important lines of agricultural production from 1900 to 1950, the pattern would follow very closely that which I have described for hogs. On the fifty-year trend line, there would appear sharp upward movements, one or two for each decade, which were caused by the introduction of new methods, machines, etc. To illustrate, take corn production. During the first decade, the colleges in the corn belt put great emphasis on new methods of selecting, drying and storing seed corn so as to secure high germination and a more perfect field stand. By means of local community testing plots, higher yielding varieties were replacing poorer varieties. In the late twenties, hybrid seed corn began to be produced and used. It increased the yield about 10%. In the late twenties and thirties, tractors began replacing horses on Corn Belt farms. This permitted farmers to keep their field work "ahead of the season." Even though the spring was late, the tractor could be worked at night, if necessary, and the corn planted on time. In the thirties and forties, four row corn planters and cultivators and two row corn pickers replaced single row equipment. In the late forties and early fifties, cheap nitrogen fertilizers began to be used, which increased the yield from 5 to 25 bushels per acre.

Wheat - During the first two decades, new varieties of high quality milling wheats were introduced. In the early twenties, a highly efficient three plow tractor was manufactured which was well adapted to family wheat farmers. By 1930, these tractors were mounted on rubber tires, which greatly increased their efficiency and flexibility. The tractor power made possible much more effective moisture control in the semi-arid regions, and furrow drills planted the wheat so as to eliminate winter killing. During the thirties, the combine practically replaced the binder and header in the harvesting of wheat.

Dairy Products - First came cow testing, then tuberculosis and Bang's disease control. By 1930, milking machines began to be common with farmers having more than fifteen cows. Increased knowledge of nutrition and feeding greatly modified the rations which were fed dairy cattle. In the thirties, sire testing came into more common use together with artificial insemination. In this manner, the germ-plasm of American dairy cattle rapidly changed, and high producing cows began to replace average cows.

There has been a constant change in the basic practices of production. These practices have grown out of research in the basic sciences, such as Biology, Genetics, Biochemistry, Physiology, Physics, etc., and the technologies of agriculture, agronomy, horticulture, dairy science, animal husbandry, agricultural engineering, veterinary science, etc.

Of course, the development of good roads, of automobile and truck transportation, of telephone and radio, made possible great changes which speeded up communication, marketing, and all aspects of farm production.

By 1950, it was estimated that five and a half million farmers, instead of six and a quarter million in the decade before World War II, representing 13-1/2% of the nation's population, now feed and clothe the United States better than they have ever been fed and clothed before, and produce as much surplus as can be exported and still pile up the largest agricultural surpluses ever known to man. It is estimated further that one half of the five and one half million farmers produced 90% of the agricultural products that go into commercial distribution. Since 1940, while farm population decreased 27%, total productivity increased more than half. The productivity per man has almost doubled during the past fifteen years! While these changes are startling, nevertheless they are part of the society and economy in which the same kind of changes have been taking place in production in all fields. Those practices which have to do with farm production, farm management, etc., are directly or indirectly the result of research carried on by the experiment stations under the Department of Agriculture. The changes in the ways that farmers think about research and the ways they use it have also been very great. The organization of research has changed, and likewise there has been a great change in the methods of diffusing this knowledge to farmers.

Many farmers can no longer farm by following traditional practices. They are confronted with the problem of replacing old practices with new practices. In general, the farmers who first adopt new practices, theoretically at least, make more money than those who do not. By using the new practice, they are "low cost producers" until the majority of the farmers change to the new practice and a new equilibrium is formed between cost and output. These changes, particularly in stepping up the efficiency of labor, have reflected themselves in increasing the size of farms. A Corn Belt farmer, for instance, who had been farming 160 acres of land with perhaps four work horses, shifted to a "three plow four row tractor." He now has the equipment to raise, let us say, 160 acres of corn if the machinery can be used at its optimum capacity, instead of 50 acres of corn, which would be about the limit of the two bottom gang plow and the two row horse drawn corn cultivator. His investment, however, in a tractor and the equipment that went with the tractor has increased over what it was with the horses, perhaps three times. The tractor and the gasoline involve money expenditures, whereas the feed and horses were raised as a part of the farming operation and were, in that sense, self-sufficing. Therefore, the tendency of this technology in doubling the output per man, has been to increase the size of the farm and the capital investment, and to make a sharper division between small and self-sufficing farmers and farmers who, while still family farmers, are still far more commercial than they were before.

I cannot emphasize too strongly the great change that the newer technology has made in changing the personality and attitude of farmers and in making them much more responsive to all aspects of farm research. Let us assume that an Iowa corn-hog farmer was 40 years old and had a son 15 years of age when he first vaccinated his hogs for cholera in 1910. By 1930, this son might well have started farming "for himself," and as a young man, might have carried on a demonstration for the county agricultural agent of the McLean County System. Quite likely, the son of the original farmer is not farming now, and possibly his son has taken his place. The grandson of the original farmer has had a cultural inheritance in attitudes and in methods which grew out of 40 years of development prior to his becoming an active hog producer. He is quite unconscious that he himself is far different in his attitudes and behavior than was his grandfather. Either he or his father might well have been members of "Ton Litter 4-H Pig Clubs." He might well have been a vocational agriculture student in the local high school and is now a member of the local chapter of the Future Farmers of America. At any rate, he is acculturated to a very different farm situation than was his grandfather, and the attitude of keeping up with the changes in production practices is more or less second nature to him.

3. THE BASIC EDUCATIONAL RESEARCH INSTITUTIONS OF SERVICE TO FARMERS

Colleges of Agriculture - Land Grant Colleges and Universities
State Agricultural Experiment Stations
Cooperative Extension Service - Agriculture-Home Economics 4-H Clubs
United States Department of Agriculture

Cultural anthropologists say that the basic functions of cultures which grow out of the necessities of human living change but little, but the forms in which these functions are expressed vary tremendously from culture to culture, as does the speed with which social change takes place. The function of education, therefore, and the function of inquiring into nature's ways, has always been with man; perhaps, at times in an almost embryonic form. In farming, however, the function of developing technical knowledge out of the results of research and passing this technology on to farmers was not highly developed in the agricultural colleges until about 1900. Over the past fifty years, great specialized functions in agriculture have developed. Technical agricultural education is necessary to supply trained people to serve farmers as researchers and extension workers in connection with their problems and their needs. These specially trained people have become technicians and the educational servants of the farmers of today. They have been at the core and almost at the fountainhead of the revolutionary changes that have previously been described.

The arguments in behalf of the Morill Act, which passed in Congress in 1862, was that these colleges would train farmers and mechanics. I have failed to discover in the writings and discussions of that period any indication of what was going to happen, and that the so-called "people's colleges" would not be training young men to be farmers, blacksmiths, carpenters, etc., but would instead be training researchers and technologists and, later, extension workers, who in turn would diffuse knowledge to the farmer on the farm and the mechanic at the bench. The following section of this memorandum will deal briefly and very inadequately with relation to this research and educational public service system, which is somewhat unique in the United States. European countries hardly took cognizance of this type of service to agriculture until World War II. During World War II the increased contacts with the United States gave the representatives of many democratic nations of the world an opportunity to observe the great quantity of agricultural production which could be turned out with the limited war-time manpower available to agriculture. The world problem of post-war rehabilitation of agricultural production, and the need for our food and fibre, caused the United National Organization and its specialized agriculture sector (FAO), to observe and emulate our system of public services to agriculture. When the Marshall Plan and Point 4 came into the picture, we generously sent out technicians to "under-developed countries" to assist them in developing within their countries institutions and approaches similar in essence, but perhaps different in form, to the public services which had developed in the United States during the past 50 years.

Colleges of Agriculture - Land Grant Colleges and Universities:

Thomas Jefferson was the first prominent man in America to advocate the idea that agriculture was to become science and that "there should be chairs of rural economy in the colleges of the country." He provided in his plans for the University of Virginia that one of the six main departments would deal with agriculture. It is, therefore, both fitting and proper that the auditorium of the U. S. Department of Agriculture is christened Jefferson Memorial Auditorium in recognition of the man who, more than anyone else, was the exponent of the idea that "agriculture was a science which drew on the basic sciences of chemistry, botany, meteorology, etc." and that an era lay ahead in which agricultural science would stand on a level with the other sciences which benefit mankind. Incidentally, his library which was sold to the Library of Congress contained the largest collection of books on agriculture and the sciences related to agriculture that had been accumulated in this country up to that time. It is sometimes said that the Land Grant College Act of 1862, to establish People's Colleges in Agriculture and Mechanical Arts, was a revolt against classical and professional education at that time. I doubt if there is much justification for this statement. Dr. William Russell, formerly Dean of Teacher's College at Columbia University, has said that they were an expression of frontier America and grew out of pragmatic ideas with reference to the needs of American society. In the midst of the turmoil of the Civil War, Congress passed the Morill Act in 1862 which set up in each state a college "where the leading object shall be that, including other scientific and classical studies, and including military tactics, to teach such branches of learning as relate to agriculture and mechanic arts in such manner as the legislatures of the states may respectively prescribe, in order to promote the liberal and practical education of the industrial classes in the several pursuits and professions in life." It was in the late 60's and early 70's before the states were in a position to open the doors of these colleges. There were no teachers of agriculture. An agricultural college had opened its doors in Germany about 1818, and the Royal Agriculture College of England was established about 1840. There were numerous writings about agriculture by the agricultural journalists of the time, and a few books were written by chemists about the soil. Competent professors of agriculture did not begin to appear until the late 80's or early 90's. There were few agriculture students, and the state legislators appropriated but little or no money. Many of the students who came to the land grant colleges at that time instead of taking agricultural courses, took courses in engineering, or science, or training which would permit them to teach in high school.

By the early 90's complaints began to arise from people interested in agriculture that the colleges were rendering no service to agriculture. As an example of the change that was beginning to take place, let me cite an incident in the history of what was then called the Iowa State Agricultural College, later Iowa State College. In 1892, a group of 5 or 6 men met in Des Moines, Iowa, to formulate a protest to the Board of Trustees of the Iowa Agricultural College. They said the school had been in existence for 25 years and had graduated, all told, about 600 students, only 25 of whom had taken the agriculture course. They proposed the employment of a new president who was sympathetic to agriculture, and the engagement of a new professor of agriculture who could get money out of the legislature, drum up students to take the agricultural course, and get friendly support from the Iowa farmers. "Uncle Henry" Wallace called the meeting and was chairman. He was founder and editor of Wallace's Farmer, father and grandfather of two future Secretaries of Agriculture, and perhaps the most influential man on farming matters in the State of Iowa at that time. The committee met and decided three things. First, "the right kind" of an educator should be chosen as president of the college. Second, the agriculture course should be thrown open to the sons and daughters of Iowa farmers, about the only entrance requirement being that they were farm raised and had completed the country school. At that time, few farmers' sons and daughters attended the high schools which were in the larger towns; however, the entrance requirements at the college insisted on freshmen being graduates of high schools. And, third, that the professor of agriculture must be a man who would be well received by farmers and could get money out of the legislature. One of the men on this committee was James Wilson, who was born in Scotland and had immigrated to Iowa before the Civil War. He had been a member of the legislature for three terms and Speaker of the House for one term. He had also been a member of Congress for two terms. He lived on and operated a 400 acre farm and was a breeder of short-horned cattle.

The committee, after surveying the field, and making recommendations about a new president, implored "Tama Jim" Wilson of Tama County to go to the college long enough to get it on the right track with respect to agriculture. The committee decided that he was the one man who could get money out of the legislature and support from the farmers. At the opening of the college year in 1892, he left his farm and his excellent herd of registered short-horned cattle, and went to Ames. The new president of the college arranged for him to interview every boy that came from a farm, regardless of what the boy thought he wanted to study once he got there. Wilson promised these boys that if they took the agricultural course, upon graduation they would get jobs in agriculture that would give them twice as much pay as they would get if they were science teachers in the Iowa high schools. The new president removed any high school requirement for students entering the course, and the new professor of agriculture assured them that if they would work hard, they could be graduated from the combined preparatory course and the four year course within four years. In this manner he got 27 new students signed up for the agriculture course. When the State Legislature of Iowa met in January and February of 1893, he went before that body with tears almost streaming down his cheeks with the story "that times had changed in Iowa." It was going to become a great agricultural state, and the sons and daughters of farmers were crowding into the college to study agriculture, but the colleges had no facilities for teaching them. There was no agricultural building, there was little improved livestock, and yet the students were there to study agriculture. Even though the times were hard in 1893, the Legislature responded by appropriating $100,000 to build an agricultural building, to improve the farm facilities and livestock, so that the great State of Iowa could really begin seriously giving college training in agriculture. In 1897, Professor Wilson went to the McKinley Cabinet as Secretary of Agriculture, and held this post for 16 years. He made good on his promises to the entering class of 1892, and saw to it that those who desired them "got jobs at twice what they would have gotten if they would have taught in high school."

This story is worth repeating, because it illustrates the kind of thing that was going on in many of the agricultural states in the 90's. By approximately 1900, the colleges had accumulated a good deal of momentum. In 1903 the Iowa State Agricultural College went back to the requirement of high school graduation as an entering requisite. The general agricultural course was greatly improved, and the demands for graduates far exceeded the supply. The original idea, as I have pointed out before, was that the colleges would train young men to become farmers. This they have done to a certain extent. It is estimated that about 40% of the graduates in agriculture are directly engaged in farming, but of far greater significance, the colleges have trained the professional personnel for agriculture which it had to have in order to expand in the specialized fields of services that were developing.

Some Facts and Figures about the Land Grant Colleges:

The agricultural courses dealt primarily with the agricultural technologies, agronomy, animal husbandry, horticulture, dairying, and agricultural engineering. In the 1930's a few institutions gave major courses in agricultural economics. In the 1930's a division of agricultural education was established in many colleges for training vocational high school teachers in agriculture and home economics. The core courses in the college of agriculture have dealt with specific aspects of agriculture largely from the point of view of the natural sciences. As the results of research and systematic scientific knowledge as it applies to agriculture has increased, the technical courses have expanded in both content and in time requirements. This expansion could only have taken place at the expense of the basic supporting sciences, botany, zoology, chemistry, physics, mathematics, etc., and general cultural courses. Many of the courses in agriculture require laboratory periods. The quality of the college teaching in the agricultural subjects is on the same level as far as standards are concerned as other technical and scientific courses in colleges and universities. The developments in the social sciences, as far as agricultural students are concerned, have been confined largely to agricultural economics and somewhat to rural sociology. The students in agricultural education get some courses in educational psychology and general education. There are very few opportunities as far as the agriculture student is concerned, to get very much in the field of the behavioral sciences or to be exposed to the developments in those fields that throw light on personality, culture and behavior. There are two exceptions to this general statement; the Michigan State College has extended the agriculture course to 5 years and basic courses are being given dealing with the nature of man, his institutions and the contemporary civilization in which he lives. During the time that Dr. Milton Eisenhower was president of Kansas State College, he instituted a number of changes to give a broader base both to agricultural and engineering education. He secured a grant of funds to establish an institute of citizenship, which was to render service in this field both to college students and to feed into the state-wide extension service. At the dedication of "Eisenhower Hall" on the campus of Kansas State College Dr. Eisenhower, now president of Pennsylvania State University (formerly Pennsylvania State College), said that the technologies alone are not enough. Russia seems to be, perhaps, as successful as we are in teaching technical engineering and agricultural science. The conception of the nature of man and the values or philosophic goals that men are seeking are entirely different in Russia and in the United States. In other words, the technology is the same, but the humanities and social sciences and philosophies are wholly different. President Milton Eisenhower went on to say that the great problem now of the Land Grant Colleges is to maintain all of the gains they have made in the fields of science and technology, but to combine with these a certain amount of required teaching in the fields of basic social sciences and the humanities, as a minimum aid to understanding the democratic way of life and the great conflict of ideas which is of such great importance to the future of civilization.

There are 52 land grant institutions and 17 "institutions attended predominantly by negro students." The principal professional fields included in these colleges are Agriculture, Engineering, Arts and Sciences, Business and Commerce, Veterinary, Forestry, Home Economics, etc. In 1953, the total enrollment was about 320,000, of which 27,400 were enrolled in Agriculture, 17,600 in Home Economics and 62,400 in Engineering. In 1953, there were granted 5,167 Bachelors Degrees in Agriculture, 1,126 Masters Degrees, and 473 Doctors Degrees. In Home Economics, there were 3,000 Bachelors Degrees, 387 Masters Degrees, and 36 Doctors Degrees.

The Agricultural Experiment Station:

Very little research or experimental work was done on the college campuses until funds were supplied by the Federal Government in 1887 for the establishment of agricultural experiment stations. In 1925, a third act of Congress (the Purnell Act) considerably expanded the Federal support of the state experiment stations and provided for research work in the social sciences and home economics. At the present time, the total budget of the state experiment stations and the Department of Agriculture for agricultural research is about one hundred million dollars per year. In 1955 the state experiment stations expended a total of $91,136,719.15, of which $18,979,214.48 came from Federal Government sources and $72,157,504.67 from state sources.

After 1910, young men entering the agricultural research field began receiving graduate training and doctors degrees. In many cases, these degrees were given in the basic scientific fields, but the doctor's dissertation was written on some problem of agronomy, animal husbandry, dairying, horticulture, etc. By the middle teens, both the researchers and the teachers in agricultural courses began to stand on the same level as far as academic training was concerned as the teachers in the natural basic sciences.

The research program has always been more or less definitely directed toward what is called "problem research." The problems attacked are those which are troubling farmers and are limiting factors in agricultural production and in farm profits. Through agricultural commodity committees, representing a particular line of agricultural production, or through the extension service, there is a good deal of consultation and collaboration between the producers and the experiment station staff. To illustrate, the apple picking season for commercial producers is limited. The apples cannot be picked before they are ripe, on the one hand, and they have to be picked before frost, on the other. If there happen to be wind storms during the short apple picking season, the growers have tremendous losses because the apples fall to the ground. Growers have observed from time immemorial that some years the apples drop badly, other years they seem to stay on the trees, even though there were wind storms and disturbing conditions. The growers, in effect, said to the experiment station, "Can't you find some way to prevent the 'apple drop'." The researchers said, "We'll try." But to get at the reasons why the apples dropped required studies of the physiology of the cell structure of the apple stem, and the biochemistry of the apple trees, which went to the frontier zones of knowledge of biochemistry and the physiology of plant cells. Eventually, a hormone was discovered which, if properly sprayed on the trees, within limits prevented the "apple drop." Incidentally, the results of this research were released to all the manufacturers of agricultural spraying materials in the late 30's. The county agricultural agents discussed the new discovery at meetings of apple growers the following spring, and the dealers who sold spray materials to farmers passed out advertising material and took advance orders for the spray. It was estimated that the spray was used by 80% of the apple growers the first year that it was released. The point about this story is that from the standpoint of the experiment station, they were carrying on "problem research," rather than fundamental research for the purpose of increasing man's knowledge of nature. The apple growers of New York could urge the members of their legislature to get behind appropriations for the Cornell Experiment Station to find an answer to the problem of apple drop, whereas it is doubtful if they would have any such motivation if the objective of the research was exploring the unknown in the biochemistry and physiology of cell change.

The statement made above needs modification and qualification in terms of historical perspective. The attitude of the farmer toward so-called basic or fundamental research in contrast to so-called problem research is changing rapidly and the last two acts of Congress which made substantial increases in federal appropriations to the experiment stations have authorized the use of funds for so-called basic research, not so much for expanding the range of human knowledge as to furnish tools for getting the answers to specific problems.

Almost nothing has been said thus far about the social sciences and their place in the research picture. Instruction and research in the fields of economics and sociology were very limited both in the college and the experiment station until World War I. Up until that time, Cornell University and the University of Wisconsin were the principal institutions giving graduate work and very little agricultural economics and rural sociology was taught in the agriculture courses. The Bureau of Agricultural Economics was established in the Department of Agriculture in 1919, and from then on agricultural economics had a very rapid development. The Purnell Act of Congress in 1925 authorized experiment stations specifically to enter these fields, and about that time the Social Research Council was instrumental in getting money for graduate scholarships in Economics and Sociology. The students who were awarded these fellowships came from the colleges, and most of them went to the larger universities for their graduate work. They were thus first trained in economics and sociology and then returned to their institution to develop the agricultural aspects of the same. It is estimated that 2500 Masters and Doctors degrees have been given in agricultural economics and sociology in the last 25 years.

The Cooperative Extension Service - Agriculture-Home Economics 4-H Club Work:

The reader will recall reference made at the beginning of this memorandum to the statement of Professor Hatch of the University of Wisconsin that the time had come to add the third leg to the agricultural tripod. He said that an institution of some kind needed to be established that would reach the farmer and help him take advantage of the results of agricultural research. Such an institution, he said, would not only give prosperity to the farmer, but would also add to the wealth of the nation. The question of how to do this was widely discussed in the decade between 1905 and 1915. Out of all this discussion evolved about 5 different plans for doing what needed to be done.

1. The Farm Demonstration Agent Approach:

Dr. Seaman A. Knapp was the principal advocate of this approach. The cotton boll weevil infestation, which moved from Mexico into the southern states, produced great alarm. There was no effective method of controlling the insect, and many feared it would wipe out the cotton economy of the south. Therefore, a new farm economy must arise, which was based on diversified agriculture production, rather than specialized cotton growing. Dr. Knapp, representing the Department of Agriculture and the General Education Board, in 1903 instituted a system of farm demonstration agents. These men were not college graduates. They were farmers who were somewhat ahead of their neighbors, who could talk well, and, as Dr. Knapp said, take the farmer by the hand and show him. They worked largely through crop demonstration. By and large, they were successful and attracted a great deal of attention.

2. The Agricultural High School Theory:

The Assistant Under Secretary of Agriculture at that time, Professor Willet M. Hayes of the Minnesota Agriculture College, had, himself, been a country school teacher and was interested in agricultural high schools for farm communities. He made a trip to Denmark and saw the Danish folk schools. He came back and advocated a system of consolidating the rural schools and having a rural high school in the center of each township. The rural high school would have some of the characteristics of the Danish Folk School and the teachers would not only work with the pupils, but with their parents on the farm. There were many advocates of this theory.

3. The Agricultural College Approach - A Member of the Faculty Assigned to the County as a Field Educational Representative:

The advocates of this plan said, "Let us have one of the teachers from the agricultural college go and live in a rural county and represent the college and the experiment station. In order to keep it out of politics, he should be a member of the agricultural college faculty assigned to work in a county. He will do all kinds of things to promote more profitable agriculture and better living for farmers in the county." One of the chief advocates of this plan was Kenyon Butterfield. Professor Butterfield had been an active worker in the Grange and for a time was state lecturer of the Michigan State Grange. He was interested in sociology and had taken a doctors degree in general sociology, education and philosophy at the University of Chicago shortly after 1900. He was a man of many parts; a botanical scientist, the leading horticulturist in America, a poet, a philosopher, and an accomplished writer. He was the chief proponent of the idea of a program of informal education which included the entire farm family, and thus closely related the farmers and the rural community to the faculty and campus of the college of agriculture. After considerable discussion this approach became the official approach of the Land Grant College Association. And the then Secretary of Agriculture, James Wilson of Iowa, whose loyalty to the Iowa State Agricultural College did not diminish when he became Secretary of Agriculture, was an important factor in promoting this idea among agricultural leaders and members of Congress.

4. The Proposal for a County Secretary of Agriculture:

Another theory developed that each county should have a county secretary of agriculture. He ought to be about the same thing to the county that the State Commissioner of Agriculture was to the state. He ought to be a practical farmer, possibly he should be elected, the same as the county officers in the court house, and he should be a kind of handyman, doing anything that might be done to assist the farmer, but he would be a "county man" - one of the farmers of the county without any connection or domination by outside interests.

5. Rejuvenating the Rural Schools:

Another line of thinking came from the celebrated Liberty Hyde Bailey, Dean of Agriculture, Cornell University. Bailey, as a young man, had taught in a country school in Michigan before attending the Michigan Agricultural College. He was an outstanding student, and after graduation, went on to Harvard, where he studied botany under the great botanist of that time, Asa Gray. His experience as a country school teacher made a great impression on him, and at that time, it is probable that no dean of agriculture had greater prestige in this country. He saw great value and sociological significance in the small rural district school. He was skeptical about the various proposals outlined above, but thought there should be a great movement for the rejuvenation of the rural schools and for the teaching of agriculture and nature study in the one-room rural schools, and of relating these schools and their teachers to the farmers who lived in the school district. In addition to the one-room country schools, there should be district rural high schools not exactly on the pattern of the Danish high school, as proposed by Professor Hayes, but yet the kind of high school which would give inspiration, love of rural life, and skill in agriculture and home making to its students. Under such a system, he said, it would not be long before we would begin to have a generation of farmers who had basic understanding of the forces of nature and of the things which made for good farmers.

By 1905 or 1906, the problem of how to reach farmers in an educational way, so as to bring about improvements in developments in agriculture, had become a subject of nation-wide discussion. It was close to the heart of Theodore Roosevelt, who when he was president, was greatly concerned about the movement from the farm to the city. He had a feeling that the nation must have a strong, healthy agricultural rural economy at its base, and that too many capable farm boys were leaving the country and going to the city. He was greatly concerned about the abandonment of farms in the hilly sections of New York and New England. The work of Dr. Seaman A. Knapp in connection with the cotton boll weevil in the south had attracted his attention. He personally liked Secretary James Wilson, and enjoyed visiting with him on farm and rural matters. As an expression of his deep concern about agriculture, he appointed a National Country Life Commission in 1908, and charged this Commission with the responsibility of getting at the problems that concerned him; of finding out what the trouble was, and what should be done about it. Liberty Hyde Bailey, Dean of the Agricultural College, Cornell University, was made chairman. "Uncle Henry" Wallace and Professor Kenyon Butterfield were members, as well as about 7 or 8 other nationally prominent people in agriculture. The Commission and its objectives were well dramatized by T. R. It did much to pave the way for the future and to stimulate wide-spread interest in the problem.

The report, when made, essentially said that the fundamental difficulty was "lack of the proper kind of education." The Commission Report called for a "redirection in education whereby schools would serve a new kind of function at the center of the rural community." The following excerpt from the report is of major importance.

"The consideration of the educational problem raises the greatest single question that has come before the Commission, and which the Commission has to place before the American people. Education has now come to have vastly more significance than the mere establishing and maintaining of schools. The education motive has been taken into all kinds of work with the people, directly in their homes and on their farms, and it reaches mature persons, as well as youths. . .

"The arousing of people must be accomplished in terms of their daily lives, or of their welfare. For the country people this means that it must be largely in terms of agriculture. Some of the colleges of agriculture are now doing this kind of work effectively, although on a pitiably small scale as compared with the needs. This is extension work, by which is meant all kinds of educational effort directly with the people, both old and young, at their homes and on their farms; it comprises all educational work that is conducted away from the institution and for those who cannot go to schools and colleges.

"The best extension work now proceeding in this country -- if measured by the effort to reach the people in their homes and on their ground -- is that coming from some of the colleges of agriculture and the United States Department of Agriculture. Within the last five or ten years, the colleges of agriculture have been able to attack the problem of rural life in a new way.

"This extension work includes such efforts as local agricultural surveys, demonstration farms, nature-study and other work in schools, boys' and girls' clubs of many kinds, crop organizations, redirection of rural societies, reading clubs, library extension, lectures, traveling schools, farmers' institutes, inspections of herds, barns, crops, orchards, and farm publications of many kinds, and similar educational effort directly in the field.

"To accomplish these ends, we suggest the establishment of a nation-wide extension work. The first or original work of the agricultural branches of the land-grant colleges was academic in the old sense; later there was added the great field of experiment, and research; there now should be added the third coordinate branch, comprising extension work, without which no college of agriculture can adequately serve its state. It is to the extension department of these colleges, if properly conducted, that we must now look for the most effective rousing of the people of the land."

It is said that the first county agent to operate on a county basis began his work in 1906. At any rate, in 1908, Dr. Knapp proposed that the demonstration agents whom he had working in the cotton states operate largely within the area of a county. In a number of states, farmers and colleges did not care to wait until the passing of the Federal act, but in various ways started "county agents" on their own. In 1910 400 county agents were working, and by 1914 over 700 counties in the United States had full-time or part-time farm demonstration agents.

After 4 years of nation-wide discussion in Congress and in the Land Grant College Association, the Smith-Leaver Act was passed in May 1914. This Act gave Federal sanction for the establishment of extension work in the Department of Agriculture and provided a basis of cooperation with the state agricultural colleges. Each state was to receive Federal funds amounting to $10,000 annually and after the first year an amount prorated among the states on the basis of rural population from a fund of $500,000, which was to increase annually for 7 years, and continue thereafter as an annual appropriation of $4,585,000. The Act provided that extension work should be carried on under the direction of a land grant college within each state and in cooperation with the Department of Agriculture.

Extension work in the language of the Act was defined as follows: "to aid in diffusing among the people of the United States useful and practical information on subjects relating to agriculture and home economics and to encourage the application of the same." It implied that the farm family approach would be used, and that in addition to diffusing useful and practical information in agriculture and home economics, informal work would also be done with farm boys and girls.

After the passage of the Smith-Leaver Act, each state college prepared a plan for organizing and developing extension work within the state. The Department of Agriculture set up two divisions for administering their end functions in relation with the state - the Office of Extension Work, South - which included the states south of the Ohio River as far west as and including Texas, Oklahoma and Arkansas. The remainder of the country was administered as the Northern-Western States. This separation into two groups continued until shortly after World War I. In this formative period the administrators of extension work had very little to do with the professional field of public education. There was no antagonism between the colleges of agriculture and the departments of education in those land grant colleges and universities in which teachers and school administrators were being trained. The department of education confined its field largely to the public school system, and the training of teachers and the development of vocational education. The colleges of agriculture were intent on reaching the farmer and to go back to the philosophy of President Van Hise, of the University of Wisconsin, to include all of the farmers and farms on the college campus. So far as I can learn, there were very few instances where either the agriculture people or the educational people thought of getting professionally acquainted with each other, and for that matter, this same situation more or less exists today. It should be pointed out that if the agricultural extension service at the beginning had a conscious educational and social philosophy which went deeper than the practical job of improving farm practices and home living, it came largely from Kenyon Butterfield.

There was very little in the way of instruction or training that could be given to the men who were starting to work in the counties. They had to be pretty much on their own. Their pattern of approach, however, was very similar, even though there was little communication between them, or little supervision on the part of the colleges.

Professor W. J. Spillman, in charge of Farm Management Investigation in the U. S. Department of Agriculture, put forth a theory that there were certain problems that farmers, through trial and error, could solve themselves, and there were other problems which required scientific investigation and were beyond the individual farmer's capacity to cope with. These had to be solved by the Experiment Station. In starting in a county, the new county agent should first get acquainted with successful farmers, and observe and learn their practices. But, at the same time, he should visit with or survey all of the farmers in the county and get at the problems which were limiting production and profits of all. We now call these problems "the felt needs." Once having ascertained these, and the practices of the "good farmers," he should go to the college and the college campus and get the information that was there available, and by putting this all together, he had an extension program for a county. This is exactly what the early county agents did. They first made friends, they isolated problems, began demonstrations in connection with these problems, and developed an organized, integrated program which grew out of the needs of the county.

It was immediately realized that involving farmers in all kinds of participation was a good thing, and that if the agent could have an organization through which he could work, he could multiply the effects of his work many times; so, the next thing he did after getting acquainted with the county was to set up some kind of county organization. These organizations were called different names in different states. In Illinois they were called Soil and Crop Improvement Associations. In New York State they were called The County Farm Bureau; in North Dakota, the County Better Farming Association. These county associations consisted usually of community units with a chairman and committee in each community, a county-wide committee, and special committees dealing with the major lines of production or with major problems. In this way the agent involved many farm families in his program. His program took on the aspect of self-help -- helping farmers to help themselves -- and the agent was the man who spark-plugged the whole thing and related it to the college. The term county agent, I think, was first developed by Dr. Knapp; the full designation was county demonstration agent. In many of the northern states the implication was that he represented the college as its agent in the county.

This form of approach and form of organization was highly successful and has remained the core, so to speak, of the extension system. Of course, the teaching methods, the methods of developing local leaders, of evolving programs, and all such things, have greatly improved; however, the central idea that extension work was primarily educational, that farmers through the organization and special skill of the county extension workers, educated themselves continues today throughout the extension system.

After the work got started in the counties, an extension staff on the college campus began to develop. This state staff consisted of three types of people: (a) administration and supervision, (b) information press services, visual aids and mass media, (c) subject matter specialists. Subject matter specialists became an integral part of each of the college departments. The animal husbandry specialist, for instance, had his office with the college and experiment station animal husbandry department. For certain intents and purposes he was a member of their staff, but instead of teaching classes or doing research work, he backstopped the extension workers in the counties. He translated the research results, from whatever source they might come, into terms which made them available for program building, for demonstration work, or what-not in the county. He frequently visited the counties, partially for the purpose of training the county agents in animal husbandry matters, and he conducted meetings where the subject matter was too highly specialized for the county agent. In addition, he performed another very important service, he took back to the research workers and the teachers of animal husbandry the problems of producing farmers and their point of view in matters of animal husbandry. This was of tremendous significance in keeping the college and experiment station "on the beam" as far as the problems of the farmers were concerned. He did not simply take the facts of research to the county, but also kept the people in the county informed as to the research that was going on, the problems that were being attacked, and the methods that were involved in the research. Thus, farmers were being informed and educated not only in the end result which had an application to their problem, but also given some insight into the nature of the basic science involved and the methods and techniques that were used in carrying on research. This is an important point that is often overlooked in connection with the extension service - experiment station relationship. Experience in agriculture has shown that it is not enough simply to give the results in terms and in a context to be understood by the users. The users, in this case the farmers, must have the opportunity of knowing something about the methods and the concepts that are involved in scientific investigation.

In this memorandum I find myself referring almost continually to the agricultural side of things and to the county agent. If time permitted, I would elaborate on the work of the home demonstration agent. I have already pointed out that according to the theory and the plan of the Smith-Leaver Act, the family approach was to be used and that home economics was to be regarded in relation to the home the same as agricultural science was in regard to the operation of the farm.

The same is true of 4-H Club Work, which is an extension service activity involving boys and girls, presumably from the age of 10 to 18 or 20. In the early days of extension work it was assumed by many that the older people were too "set in their ways" and that the best approach to social change and so forth lay in getting hold of their children, involving them in projects such as raising calves, keeping a flock of chickens, raising a litter of pigs, an acre of corn, or half an acre of cotton. These Clubs were organized on a community basis, usually with some farmer or farmer's wife as the local leader. They met in the homes of the members, perhaps once each month. They kept records of their projects and the Club leader assisted them in carrying them out. During the year, preferably in the fall, contests were held and prizes were awarded to individual Club members. Club work not only supplemented teaching in the school, but also served to demonstrate certain things that were in the county extension program. The 4-H Clubs soon began to develop prestige. Farmers took pride in their children belonging to the Clubs and the community came to regard them as very significant activities, both in the field of character building and as a means of developing in the child an interest in and a pride in farming and farm life. It was soon found that the Clubs worked better if there was a division between the adolescent and pre-adolescent youngsters. It is estimated that over 50% of the fathers and mothers in the farm homes of today were members of 4-H Clubs yesterday. All evaluation studies indicate that they have been a very constructive force with rural children.

The extension service soon found it necessary to develop all the avenues available for dissemination of agricultural information. This work began first with the extension editor, who was skilled in the preparation of printed and illustrative materials. This meant that he wrote extension circulars, translating research into simple and attractive "how to do" leaflets and circulars. He assisted the county agents in preparing local farm news for the county papers. He supplied the agricultural press with extension material. He wrote posters and designed placards for exhibits. It was natural that he become a photographer and either prepared lantern slides or supervised their preparation in the days of the stereopticon. He supervised art work, drawing and the development of illustrative material, and as radio and television developed, it was his responsibility to gear these new media into "the dissemination of useful and practical information," both as a direct operation of the state extension office, and also as a supporting, or backstopping service to the county extension office.

It is more proper at present to think of the agricultural extension work of a college as being carried on by a county staff rather than the county agent and the home demonstration agent. The increased demands of farm people in the county for greater service from the Extension Service has necessitated a gradual expansion, so that in most counties in the United States at the present time there is at least a staff consisting of the county agricultural agent, the home demonstration agent, the 4-H Club agent, and a receptionist and secretary, who is very apt to be the daughter of a farmer in the county, who knows most of the farm people and can render a great deal of service to office callers "over the counter", so as not to require the professional worker to devote so much time to personal service of office callers. The extension office is a center for all kinds of activities and services within the county. It is more than an outpost of the college and the U. S. Department of Agriculture. The type of service in the county has changed, and while a great deal of individual, personal service is rendered callers, the extension staff devotes increasing percentages of their time to well thought out integrated programs, which are designated to meet the needs of the county and to reach all of the people within the county. The methods of teaching, of organizing, of involving people, have greatly improved. The county worker, himself, is becoming more and more of a highly skilled professional educator.

Paralleling the development in the county has been the development of the state extension staff, located on the campus of the agricultural college in all states but two, and the staff of the federal extension service in the U. S. Department of Agriculture, which does not work directly with farmers, but with the state extension service. The state extension staff in the last quarter of a century has made great strides in administrative organization, and in performing the multitude of necessary services that lie between the extension staff in the county and all that goes on in the experiment station in the college and in the U. S. Department of Agriculture, which is related to the county extension program.

The extension service has become not only the greatest adult educational enterprise in the United States but, I presume, in the world. There are now almost 14,000 professional extension workers in the United States, and the total budget of the Cooperative Extension Service, 1955-56, is $109,664,000. The total enrollment of the 4-H Clubs is a little more than 2 million boys and girls. This great organization is well integrated and well administered, and has high prestige and standing among the farm people of the United States.

Vocational Agricultural High Schools:

The reader will recall that before 1914, during the formative period of the extension service, there was a large group of people who believed that the rural schools should be involved in agricultural welfare and that agricultural high schools should be established to serve rural youth. Several such high schools were established during that period. The land grant college people and the public school people seemed to understand each other, and to assume a division in interest and approach; consequently the land grant colleges pretty much went their own way in developing legislation with reference to extension work, and the public school people, largely through NEA, proceeded along a somewhat independent course. The educators were generally opposed to the idea of separate high schools for agricultural students. They felt the schools should come to the farm child rather than the farm child having to go to a boarding school that would be too far from his home to make it practical for him to live at home.

The educators also had the viewpoint of vocational education as something which included all vocations, and that it would be unwise from the standpoint of the high schools in a typical community of the United States to separate the various vocations. After considerable discussion in educational circles, Congress in 1915 passed the Smith-Hughes Act, which provided for the teaching of agriculture and home economics in high schools, and made appropriations which, according to certain formulas and local requirements, could be allotted to local high schools teaching vocational agriculture and home economics. The teachers of agriculture and home economics in these schools had been trained at the land grant colleges. The teachers used the project form of teaching which involved the pupil and his home in farm projects, and, therefore, the schools carried out certain ideas in the Country Life Commission Report. The vocational agriculture department of the local or community high school has had very close contact with the farms of the pupils, and for that matter, has rendered great educational service to the farmers in the district it serves. This has been done so as not to compete with the program of the extension service; rather it complements and supports the extension program. The vocational agricultural schools have been a tremendous factor in rural America. A large percentage of their pupils has remained on the farm and in the community in which they were born and went to school, and the result of this kind of education is recognized as a tremendous factor in the present situation. The limits of this memorandum forbid more elaborate or detailed discussion of the work of the Smith-Hughes vocational agriculture and home economics teacher. While the activity is administered by the local school board, the state department of education, and the Federal Office of Education, there has never been any serious problem of competition or lack of coordination between this great public school enterprise and the land grant college extension program. Since the teachers are trained in the colleges of agriculture and home economics and since they get their subject matter from that source, they are in some respects part of the agricultural college system, at least from a subject matter standpoint. Many Smith-Hughes agricultural teachers later became county extension workers. The pupils and alumni of the vocational high school departments are banded together in an association called the Future Farmers of America. This alumni association is rapidly becoming one of the important and significant organizations in American Agriculture.

Some Facts and Figures on Smith-Hughes High Schools:

In 1953 there were 10, 179 Smith-Hughes high schools, with a total enrollment of 755, 293 vocational agricultural students. The total membership of the Future Farmers of America was 383, 219 in 8, 868 local chapters. Total expenditures were $47, 490, 396, of which $16, 618, 589 was state funds, $20, 767, 184 was local funds, and $10, 104, 623 was Federal funds.

U. S. Department of Agriculture Programs:

One of the causes of delay in the passage of the Smith-Leaver Extension Act was the problem of relationship between the Federal Government and the land grant colleges, which were state institutions. There was fear, on the part of some presidents of the colleges, of domination of the colleges by the Federal Government through the Department of Agriculture, and consequently they wanted direct grants to states of extension money without any strings attached. The Department of Agriculture felt that there was a national interest in extension work and that it would be a mistake for the Federal Government to set a precedent by making grants in such a manner as not to involve "the national interest." Secretary James Wilson saw both sides of the problem, having been Dean of Agriculture at Ames and the Secretary of Agriculture in Washington. He repeatedly stated that the states and the Federal Government should consider themselves as partners in a common enterprise. A compromise was finally worked out which provided in essence that the extension service should be called the Cooperative Extension Service and its program within a state should be approved by both the president of the college and the Federal Secretary of Agriculture. If there was anything in the annual program in the state which the Secretary of Agriculture disagreed with, it would be eliminated from the partnership agreement. By the same token, the state would not be forced to do anything which the Department of Agriculture wanted done by the Cooperative Extension Service, if it did not fully agree. The personnel within the state were to be selected by the state, and appointed as cooperative employees of the Department of Agriculture by the Secretary of Agriculture. Thus, extension workers were in a way employees of the Department of Agriculture and the college of agriculture, either of which could veto any portion of their program which they did not approve. Under this arrangement neither the Federal Government nor the state could completely dominate the other. The Cooperative Extension Service did those things which were mutually agreed to and each part was free to do on his own those things which were outside of the mutual agreement. The arrangement has worked very successfully and there has been almost no disagreement between the colleges and the Department.

In 1931 the Department of Agriculture began to embark on action programs which were not primarily educational in nature and, therefore, did not quite fall within the scope of the Cooperative Extension Service. The first of these programs was the Agricultural Adjustment Administration, through which benefit payments were made to farmers to increase farm income, and various other measures were taken to bring about adjustments in agricultural production and improve the economic position of the farmer. These programs were of an administrative nature and not primarily educational. They were emergency in character and the colleges agreed that the extension service during the emergency would render all possible assistance to the program, but would not assume responsibility for its administration. After 3 years of very important and very satisfactory service to the Federal Department of Agriculture, it was mutually agreed that the extension service would not be called upon for further assistance to this program, or with the other programs such as the soil conservation service, the Rural Electrification Administration, and the Farm Security Administration. The colleges agreed for the extension service to do a certain amount of educational and informative work with reference to these programs on a friendly cooperative basis, but not to assume any responsibility thereto. These programs administered by the Department of Agriculture have been nation-wide in their scope. During the past 20 years most of the farms in the country have participated in the programs of the AAA and its successors. The Soil Conservation Service is federal in character and cooperates with Soil Conservation Districts which are governed by the farmers and land owners within the district. They carry on a program having to do with soil and water conservation and again most of the farms in the country are involved in these programs. The programs are closely related to the educational program of the extension service and there are harmonious cooperative relations between the two organizations, but their administrative lines are separate and distinct. The Farmers' Home Administration deals with low-income farmers in promoting small farm ownership and rendering supervised credit to worthy people who are unable to get production credit through the regular channels of banking. The Rural Electrification Administration makes loans to cooperative associations of farmers for the purpose of making electricity available in the farm home and on the farmstead.

These organizations deal directly with farmers and while they are not educational in character, they are to a certain extent middlemen as far as ideas and information are concerned. They are not part of the Cooperative Extension System, yet they have a great impact on farmers in changing attitudes and ways of both farming and living. They raise certain problems in the field of the social sciences -- political science and government, economics, administration and social organization.

The Farm Credit Administration, which was originally the Federal Farm Loan Board, and created by an Act of Congress in 1914, makes loans to farmers who are members of cooperative loan or credit associations to facilitate farm ownership and economical farm production and marketing. In some cases these loans are predicated on a farm plan in which the farmer agrees to make certain changes in his methods of farming or to use the funds received from the loans for certain particular purposes which affect the organization and management of his farming enterprise.

4. NON-GOVERNMENTAL INSTITUTIONS AND ORGANIZATIONS SERVING FARMING

The limits of this paper forbid any detailed discussion of the principal organizations and methods of communication that are involved in carrying information and attitude forming ideas of various kinds to farmers in relation to farming and farm life. The following is a list and description of the principal organizations of this character which deal with farmers.

Farm Organizations:

A large percentage of the farmers today belong to one or more of the three national farm organizations, the Farm Bureau, The Grange and the Farmer's Union. These organizations usually have local and state units; they publish both national and state publications, which are sent to their members and which deal primarily with economic, social and legislative problems. These organizations represent their members before the national and state legislative bodies.

Cooperatives:

Almost every farmer today is a member of one or more cooperative organizations of a business character. These organizations may be engaged in marketing agricultural products, in credit, in manufacturing and processing, in supplying farm supplies, etc. Nearly all of these cooperatives publish house organs to keep their membership informed regarding the work of their association. These house organs are usually well edited. They support the extension program and are a little broader in scope than just the area of the cooperative association.

Farm Papers and Magazines:

Nearly all farmers are subscribers to one or more of the 725 agricultural papers that are published in the United States. These farm papers are national and regional and state-wide in their coverage. They are frequently traditions in farm families who have been continuous subscribers for 3 or more generations. A large percentage of the editing and writing of these papers is now done by men and women who are graduates of the colleges of agriculture and home economics, many of whom have specialized in agricultural journalism. These papers are widely read. They follow closely the work of the colleges and experiment stations and the extension service.

Local Newspapers:

Every county extension service endeavors to supply local agricultural news to the papers within the county. Frequently, educational material having to do with farm practices or the results of recent research are rewritten in the county extension office so as to associate them with individual farmers or communities within the county. More or less abstract research results are objectively reported in terms of "results" demonstrations and local community meetings.

Metropolitan Daily Newspapers:

Many of the city dailies which have state-wide circulation now have an agricultural editor and feature either a daily farm column or a section in the Sunday paper devoted to agriculture. There are a few papers of state-wide coverage, such as the Register and Tribune of Des Moines, Iowa, which not only feature agricultural news of all kinds, but issue an agricultural supplement devoted to farms and farming. The supplement has a style of its own which makes it different from the farm paper. Rural free delivery and rapid transportation makes it possible for a farmer most anyplace in the United States to receive daily a state-wide paper carrying good current agricultural news. There is every evidence that such material is widely read by farmers. The writers and reporters again are very apt to have been trained in the college of agriculture.

Manufacturers, Advertisers and Local Dealers:

Commercial farmers are substantial buyers of all kinds of manufactured products, tractors, farm machinery, fertilizer, feeds of all kinds, household equipment, automobiles and trucks, and such other things as insurance, baby chicks, seed, etc. The manufacturers of these materials take special pains to train their dealers to understand and to be able to explain accurately and effectively the use of the particular product. They must be skilled in demonstrating it, if necessary, and know all of the points that are involved in its use. This great increase in use of manufactured products by farmers has brought about a close working relationship between this sector of private industry and the extension service, and the agricultural system which has been described in this memorandum. Local dealers and merchants both go to the county agent for information regarding the use of the things which they are distributing, and also to see that the agent is informed regarding any improvements or changes in their products. A number of the national manufacturers of farm equipment now publish monthly magazines which are informational and of high quality, and which are sent to farmers who have purchased their machines. Many of them sponsor radio and television programs directed to farmers.

Radio and Television:

Practically all farm homes now are equipped with radio receiving sets and an increasing number of TV sets are being installed. Most radio stations have programs of direct interest to farmers; market reports and weather predictions are sent out several times a day. Farm families often have the habit of listening to the radio while eating the noon meal. Many county extension officers have regular time on the radio station within their county. The National Extension Report for 1954 states that the average county extension officer was responsible for over 206 radio broadcasts during the year. There were 2, 400 counties in the United States which reported radio as one of the important avenues of communication between the county agent and the farmers of the county. Home demonstration extension workers have been skillful in using the radio as an educational approach to farm women. For instance, a state clothing specialist in New York a number of years ago devised a radio program for teaching sewing in the home. Radio extension classes were enrolled by the county home demonstration agent and at periodic intervals a radio talk was given on the assumption that the farm woman who was listening had her instruction books and materials and her sewing machine before her. It was found that this was very effective extension teaching.

A few of the land grant colleges have their own broadcasting facilities. Those that are fortunate enough, such as Wisconsin, Illinois, Michigan State, Iowa State, and Kansas, to have their own stations have developed large and appreciative listening groups within their states.

When you put together all of the agencies and avenues engaged in diffusing "useful and practical information in agriculture," they make a combination of great significance. There are two elements that tend to tie together this vast array of instruments of communication with agriculture. First, the principal source of their information in agriculture and home making comes from the land grant colleges and the U. S. Department of Agriculture. And, second, a large percentage of the people who are involved in organizing, in writing and presenting the material, have been trained in the college of agriculture. They are mostly sons and daughters of farmers, they speak the farm language, they belong to the farm guild, they know how to talk to almost any farmer in his own terms, and in such a way as to make him look upon them as neighbors.

Mr. Lester A. Schlup, Director of the Division of Information Programs, Federal Extension Service, recently said:

"The manner in which science has taken permanent root in farm practice is a compelling story, it seems to me, that has been shaped from a torrent of influences. These influences are like a group of cogs which mesh together. Each cog whirls in unison with the others giving power to and taking power from the remaining ones. All of them together transmit form and motion to the giant effort which moves rural America forward. But it is practically impossible to isolate and observe the communications cog independently from the others.

"Mostly, I imagine, the barriers to better farm production and rural living have been pushed back by research, machinery, and the diffusion of knowledge through the schools, the Cooperative Extension Service, and the one-way channels of mass communication."

5. CURRENT DEVELOPMENTS IN COMMUNICATION AND UTILIZATION OF THE RESULTS OF AGRICULTURAL RESEARCH

Thus far this memorandum has dealt largely with those developments in the agricultural sector of the national economy over the past 50 years, which have brought about the development and specialization of those functions in agriculture which have to do with the development of specialized professional agricultural workers. These specialists perform certain necessary tasks that cannot be performed by farmers themselves. These specialized functions are in the fields of scientific research, of interpreting and passing the findings on to the 6 1/2 million family farmers and their households in such a way as to make the utilization of this research and information easily understood, and its adoption a simple matter. In order to accomplish these two functions, colleges had to be developed to give the professional training required. Thus, there has developed in the division of labor a number of categories of professional workers, most of whom, but by no means all, are in the public service. These specialists are necessary to the functioning of the complex and highly efficient agriculture which we have today. In this section we shall have a look at those functions which stand between research at the college and the individual family farmer. Also, we shall make some comments regarding the factors which are involved from the standpoint of the farmers, in changing his methods in the adoption of new practices. It is recognized at the onset, as has been the case throughout this memorandum, that communication and utilization at the present time is much more simple and far better developed in the realm of the natural sciences and the technologies based thereon than in the social sciences and their application to economic and social affairs.

The term "communication" is coming into more common use as being the symbol for that phenomenon which involves the transfer, in this particular case, of scientific knowledge from the scientist and the specialist to the individual who uses it. I think the term is a little confusing, if we begin by looking at who does what instead of first endeavoring to understand the function or service which the term denotes. The anthropologists have made a great contribution to the understanding of human culture, partially because they try to look at all of the innumerable cultures of mankind and endeavor first to see those areas which are common to all. Second, they try to recognize those areas in a culture common to all, and as necessary to man's existence in a society as food is to the life of his body. Certainly, one of the great areas common to all cultures can logically be termed "communication" -- people talking with each other. We often think of this in the very simple terms of language. The individual can only understand another individual if he speaks a common language. The necessity of science has developed scientific terminology which is "Greek" to the farmer, but a necessary tool to the scientist. Now, this was not a problem in agriculture of any great significance prior to the era of research, but when agriculture became dynamic and there began to be a flow of new knowledge which would basically change farm practice, it became of tremendous importance. I think there is some confusion in the agricultural field today about the term and concept of communication; on the one hand John Dewey's definition of education, "anything that changes behavior", is widely accepted, and a kind of cornerstone in extension education, so that one might ask, what is the difference between education and communication? On the other hand, the anthropologists might comment that communication is the term which first of all describes this great area of human behavior whereby individuals talk with and understand each other. Words of common usage evolve as there is necessity for their use. The telephone came first, the name later. As I see it, in the agricultural sector the term communication is coming to be understood as the art and skill involved in the transfer of ideas of what we call knowledge from one individual or group to another. To a certain extent it involves educational methods, but in its more popular meaning it is coming to have reference to a number of skills which are closely related to the printed page, pictures and visual representations of all kinds, and mass communication through the radio. The methods of disseminating this knowledge involve the agriculture editor, and the increasing number of people that develop visual aids and all forms and methods of getting ideas over to the farmer. What I am trying to say is, as I conceive it, that it is a collection of skills, methods, and approaches, all directed to the same end, all of which are involved in agricultural programs and program making, and in practical terms take the form of tools and methods that are used by the communicator in carrying out his objectives.

From this standpoint "communications" has had an interesting and sort of parallel development with the other professional services in agriculture. At the beginning of the century the results of research in the experiment stations was presented largely in terms of unattractive bulletins in which there were many tables, few and poor illustrations, and which were written in a style with words and phrases that had little meaning to the farmer. About the time that James Wilson came to the Department of Agriculture, a series of somewhat popular bulletins, called "Farmers Bulletins," were issued. These were printed in large quantities and distributed as free Government publications throughout the United States. They had to be written in broad and general terms, and often times could not answer a specific question that was bothering the reader. At that time the principal communication from the outside world to the farmer was the farm paper, and it must be said that many of the farm papers were both well written and sound in the information they presented. As the extension service began to develop, the county agent soon learned that the local newspapers in his town were, perhaps, his best avenue of reaching people. He immediately got on good terms with the country paper editors, and either wrote local agricultural news himself, in which he involved the farmers of the county with the county extension program, or supplied the editor with the information on which such news stories were based. The country editor liked this and he cooperated fully. The farmer readers liked it too. Extension agents in the early period requested a great deal of assistance from the college in the area of the preparation of news stories, the preparation of charts, and the special preparation of experiment station material in terms of local problems in his county. The volume of requests became so large that the colleges began to specialize and the position of extension editor, or extension information specialist, was created. In addition to writing, this specialist began to develop "lantern slides," charts, and visual material of all kinds. It was not very long after the passage of the Smith-Leaver Act before "the extension information specialist" began to be a very busy man. In turn, the experiment station, either through the extension editor or another editor, also began to give more attention to "popularizing" and gradually moved in the direction of reporting research in two ways: first, the scientific bulletin written primarily for the scientist, student, and popularizer, and second, through the means of simple, well illustrated circulars, presenting facts for the use of the farmer and his family.

County agents almost from their beginning had stereopticons. They took pictures of their demonstrations and significant things in the county, and as far as possible, illustrated their talks at farmers' meetings and so forth with lantern slides. As movie projectors came to be simplified and electric current more commonly available in the rural community, county extension officers began to use educational and documentary movies. By the late 20's and early 30's, most county agents had modern projection equipment, and the extension editor or information specialist of necessity was moved into the field of visual aids. The same development took place as radio and television appeared and the requirements of both of them in the preparation of material, and in the training of extension workers to use mass communications media, again brought about by increasing demands from the county. The extension information specialist or section of the state service found itself to be a very important element in carrying out the extension program. It now involved cooperating with many agencies, many more than I have outlined above. Another important factor was the growth of the various administrative and action agencies in the U. S. Department of Agriculture, which also followed the pattern in the development of information outlets that I have previously described.

In 1913, a year before the passage of the Smith-Leaver Act, a professor at the University of Illinois who was interested in "reaching the farmer" called a meeting of the handful of men who were then agricultural editors. There were only about 7 or 8 colleges that had such people at that time. Among those who attended the first meeting, which was called by Dr. Powell, were Professor Andrew Hopkins, Agricultural Editor at Wisconsin; Mr. Bristo Adams, the Agricultural Editor at Cornell; the college editor of Iowa State College, and, perhaps, representatives from 3 or 4 other institutions. Those who attended this meeting became the organizing group of the American Association of Agricultural College Editors. From these small beginnings this association has grown to a present membership of about 400. Iowa State College last year commemorated the 50th Anniversary of the first course in agricultural journalism that was given on that campus. At the present time, undergraduate service courses in agricultural journalism and related subjects are available to most agricultural students. There are 14 institutions, however, which either have departments of agricultural journalism, or give well developed courses or master's degrees in agricultural journalism. In some cases these courses are in cooperation with the school of journalism of the institution. Eight of the 14 are in the middle west. If my information is correct, the University of Wisconsin is the only institution now that gives the doctor's degree in agricultural journalism. Among the state institutions in which instruction in agricultural journalism is quite well developed are the University of Wisconsin, Cornell University , Kansas State College, Michigan State College, Iowa State College, Oregon State University, University of Nebraska, University of Minnesota, and the University of Illinois.

The American Association of Agricultural College Editors (AAACE) has been very progressive. They have kept ahead of the developments in this field of communication. In recognition of the need of keeping abreast of the developments and of professional training, a proposal was made to the Executive Committee of the Land Grant College Association that a nation-wide workshop should be held in which would be brought together the extension editors for the purpose of having a look at the whole field, and of evaluating present methods and trends.

The first national Workshop of this character was held at Cornell University in the spring of 1949.

In early 1952, Mr. Hadley Reed, Agricultural Editor, College of Agriculture, University of Illinois, invited a few people to meet at the University of Illinois to consider the broad problem of communication development and increasing the service to agriculture. In calling the meeting he stated that it was being generally recognized that communication was a very important function, and that it had developed so fast over the past 15 or 20 years that many of those connected with it had been so hard pressed by their daily tasks that they had not had opportunity to think in broad terms, and to discuss its current problems or to plan for the future. At about that time the W. K. Kellogg Foundation had expressed some interest in the field of communication, particularly, as it was developing in the field of agriculture. The Kellogg Foundation had, since its inception, been concerned with agriculture, health and education. It had sponsored some experiments in community development in certain Michigan communities; it had followed closely the developments in agriculture that have been outlined in this memorandum, and it had raised the question as to whether or not there was something unique in the developments in agriculture which might have a bearing on the whole field of communication in adult education and community development in the United States. A representative of the Kellogg Foundation was present at this meeting at the University of Illinois, and it was agreed to hold a program development conference on improving agricultural communications at the University of Chicago, May 25-31, 1952. About 40 people were invited to this program development conference. The conference was made up of the Deans of agricultural colleges, the directors of extension and experiment stations, representatives of agricultural industries, three professors of education, Dr. Floyd Reeves, Professor of Education Administration, Dr. Ralph Tyler, Dean of Social Sciences, University of Chicago, and Dr. Robert Van Duyn, of the Kellogg Foundation. The United States Department of Agriculture was represented by Mr. Lester Schlup, of the Federal Extension Service, by Mr. Warren Meyer, Office of Experiment Stations, U. S. Department of Agriculture, and Mr. Lyle R. Webster, Chief of the Office of Information of the United States Department of Agriculture.

As a result of this developmental conference, certain recommendations were made which became guide posts in the development of communication in agriculture. One recommendation was to the effect that a national center be established on the campus of some land grant college which would have as its purpose, among other things, giving broad leadership in the development of agricultural communication in the United States. As a result of these recommendations the Kellogg Foundation made a grant to establish "The National Project in Agricultural Communications." The plans for this project were cooperatively developed by a committee appointed by the Executive Committee of the Land Grant College Association. After the project was approved and the grant made, the Executive Committee of the Land Grant College Association appointed a committee which gives guidance and direction to the project. The project, therefore, while located on the campus of Michigan State College, is in a broad way, as far as policy matters are concerned, responsible to the Land Grant College Association, and the Kellogg Foundation, as grantor of the necessary funds for its operation.

The project got under way in the Fall of 1953. Although it has a small staff engaged in carrying on its program, it is giving a certain type of leadership in agricultural communications and is working on a number of significant projects.

Thus, agricultural communications has taken its place as one of the members of the family of important specialized agencies of service to American agriculture. It is quite probable that the numbers of workers involved in this field both public and private will rapidly increase, and there is every evidence that a number of land grant colleges and universities are becoming the centers of graduate training and for research in agricultural communications. Eventually, several of these institutions will grant doctor's degrees in agricultural communications.

The field of communications in agriculture, like many other areas in which there is very rapid growth and development and multiplication of organizations performing related services, develops problems in the field of coordination. In a free society, and particularly in the United States where there is free interplay and understanding good will between public and private agencies, the present services and future development of coordination takes the form of bringing about greater effectiveness and efficiency for all through common understanding and through what might be called the establishment by common consent of some rules to govern interrelations and lines of development. It has been fortunate, in my judgment, in the agricultural communication field that a large proportion of the professional workers have been trained in the land grant colleges, and that they function within this area that I have been calling professional, organized agriculture.

Utilization:

Thus far, it would seem that there are two main approaches to communications of agricultural research results. I would call the first of these theories, "Give them the facts, period." Those who hold this view say, "Let the farmer decide whether or not he wants to use the facts. It's his business, and no one, particularly in the public service, has any right to urge their adoption. Public servants can't sell things like private salesmen." I would call the second theory, "Give the farmers the facts, plus a little persuasion and a whole lot of interpretation, and some salesmanship." In seeking state appropriations for agricultural extension and research the argument often takes the following form. "Let us say, the use of hybrid seed corn has increased the income of the farmers and the income of X state $50,000,000 annually. The amount which goes into research and extension is a mere pittance in comparison with the increased income that comes to X state as a result of its farmers using these results."

I believe that if an outside behavioral scientist were to make a psychological study of the views, motives, and personalities of the people in professional agriculture, he would conclude that they have a strong missionary bent in their makeup. Those who have this missionary bent deeply feel that it is to the general welfare of the country for the results of science in agriculture to be used by the farmers as soon as possible. Dean Mumford and the Extension Service of the University of Illinois didn't say, "Here is the McLean County System of raising worm free pigs. Take it or leave it." They put on, as did the other extension services, a campaign to influence farmers to use it. The ancient Zoroastrian religion conceived the world as a great conflict between darkness and light, between good and evil. It was the duty of farmers to pitch in and fight evil that good might eventually win. Wormy pigs were symbols of the devil; healthy pigs symbols of the good. I think this outside behavioral scientist would say that he found that the professional public servants in agriculture had swallowed William James' "Moral Equivalent of War," hook, line and sinker. Evil in modern agriculture consists of the continued use of those pre-scientific production practices which are wasteful, which are inefficient, and which minimize man's optimum use of scientific knowledge in the economic production of food and fibre. Essentially, these professional people say, "Let's move research along in agriculture at least as fast as it moves in the other sectors of society; let's communicate the results as speedily as possible to farmers; let's help farmers to understand them." Of course, in free democratic society each farmer makes his free decisions, but the current of the culture and the economic pressure makes him more and more responsive to make the decision in the direction of rapidly fitting the newer practices into his system of farming, insofar as they are economically sound and increase his net return. Farmers, like other producers in a free economic system, respond to the profit motive, but the more they are acculturated to this flow of scientific knowledge, the quicker and easier and more profitable it is to put it into use.

Studies are beginning to be made of the processes by which farmers come to know about the results of research and are motivated to substitute new methods and practices for old ones. Thus far, few such studies have been made. Those that have been made have been largely carried on by rural sociologists by survey methods. They have sought largely to get from farmers what they thought was the source of the information which caused them to change practices. One of the pioneer studies was made in North Carolina by Professor E. A. Wilkening, a rural sociologist, who had at one time been a county agent. In response to questioning a sample group of farmers as to the source of information about 8 improved practices, he got the following results.

Other farmers	28 percent
Extension Service	26 "
Dealers	16 "
Vocational Agriculture Teacher	11 "
Soil Conservation Service	9 "
Farm Journals	5 "
Other farm agencies	2 "
Radio	2 "

A similar study, made by rural sociologists in Missouri found the following as a result of a study of 279 farm operators in a northeast Missouri community. Their objective was "To get a picture of how scientific information reaches the farmer." The following indicates the percentage of the farmers interviewed who got help from particular sources.

Direct Roads of Communication:

1%	Meetings at the college
23%	College circulars and bulletins
30%	Direct from the county agent

Indirect Communication:

65%	Newspapers
75%	Farm papers
46%	Radio

Relay Stations of Communications:

22%	Meetings held by the county agent
19%	Vocational agricultural teachers
23%	Farm classes at the local high school

Integration of Communication Channels:

90%	Contacts with neighboring farmers
76%	Sought their advice within the community
90%	Friends, neighbors and relatives

Communication through Successful Farmers:

35%	Sought information from 22 farmers in the area.

These studies are significant primarily as pioneering in this field. Research of this kind will not go very far until it gets into the problem of personality, of motivation, of systems of prestige and values, and all of those complicated and complex things which underlie human behavior. They show what farmers think, and above all that there are many lines of communication, all of which are significant, and the total impact of them all is proportionally greater than any one approach.

As an indication of a "straw in the wind" of present agricultural extension development, a regional committee has been formed by the North Central States Rural Sociology Committee to study the problem of sources of information and motivation. This Committee is being financed by the Farm Foundation. Thus far, one regional report has been issued, "How Farm People Accept New Ideas," Agricultural Extension Service, Iowa State College, 1955. The report is an example of the trend in the writing and presentation used in extension publications; simple, readable, and addressed, in this case, to extension workers. In essence the report says that there are 3 stages in the process of acceptance of the diffusion process. One is awareness; 2 is interest; and 3 is evaluation, of which there is a trial stage, after which the idea is either adopted or rejected. It points out that the diffusion process varies with types of change and that there are some personal and social characteristics related to the adoption of any new practice. Some of these factors are, grouped and community behavior, personal prestige, educational development, family behavior, etc. These variations on the parts of individuals give a basis for further study and classification as to different types of personalities. There are innovators, there are followers, there are those with negative reactions, and those who, for a number of reasons, are gripped by custom and habit and are not motivated to doing things differently than they are done at the present time.

In a recent discussion of the subject "the diffusion process" by Professors Beal and Bohlen before the annual conference of the Iowa Extension Service, these rural sociologists pointed out that the farmers as users of research fall into 4 classes: innovators, early adopters, informal leaders, and non-adopters. Their present researches seem to be getting into the classification of different types of reaction on the part of farmers on the one hand and the social and economic environment as it affects the adoption of recommended practices. This indicates that this line of research will soon be grappling with very basic problems in what goes on after one phase of communication takes place.

The extension service for the past 15 years has been giving more and more attention to the professional training of extension workers in the field of what is coming to be called extension education, and in research and evaluation as it underlies and gives a basis for methods and procedures. One of the significant results seems to come from extension studies in the field of utilization and adoption in that a "multiple exposure approach," which uses and combines all of the approaches and all of the methods, is the one that gets results. Shooting with bird shot is more effective than a high-powered, long range, single bullet, for certain types of game. Therefore, the skillful county extension program utilizes all of the methods of communications rather than relying on a single approach.

The reader of this memorandum should not assume that both the communication process and its objective, the utilization of research on farms, have reached a high degree of perfection. State extension specialists frequently make "spot checks" of farmers. They might drive down a road and talk with all the farmers regarding the area of their particular interest. By way of illustration, the poultry specialist in New Jersey a few years ago made a spot check of this kind, talking with those farm families who kept between 50 and 75 hens for their own use. He reduced his survey to the 5 most essential poultry practices in connection with small flocks. He found only 25% of these farmers using all of the 5 practices. He further tried to find a satisfactory explanation in his mind as to why this was the case. What were the road blocks? Had there been a failure in communication? Was there a lack of understanding? Or, was there understanding, but for some reason, lack of motivation? And, if so, why this lack of motivation? On the basis of his interviews with 100 farmers, and the explanations that he got as to why the practices were not adopted, he, in cooperation with the county extension staff, worked out a program which provided for different kinds of approaches of communication, so to speak, for different kinds of farm situations. Instead of preparing one circular, or one set of educational materials, they prepared five. When they tried these out, they found they got a much more satisfactory result, but still about half of the farmers did not significantly improve their poultry practices. This kind of "trial and error" approach, which has characterized the extension service throughout its history, and which has been one of the greatest elements of its strength, is in the process of being supplemented and reinforced today by both research and training, and by an understanding of all of the functions of communications. The demands of farmers for professional service in agriculture and home economics continues to increase rapidly. The more usable research information farmers get, the more they demand. The importance of the function of communication and the development of the communication functions is being recognized more and more by educators and extension administrators.

SOME PRINCIPLES REGARDING THE UTILIZATION OF SOCIAL SCIENCE RESEARCH WITHIN THE MILITARY

By George W. Croker

Colonel Croker became director of the African Research Foundation in 1961, after a distinguished career in the United States Air Force. One of his assignments in the Air Force was that of administrative officer of the Human Resources Research Institute, where there was a large program of behavioral research.

What This Memorandum Is About

In the early '30's, during the construction of a tunnel through Malinta Hill -- a camel's hump of ground that divided the defense bastion of Corregidor -- a bench was built near one entrance of the tunnel and painted white. It was for the use of those who had to walk through the tunnel as well as for the guard posted at that end. However, since paint took some time to dry in those days, particularly in humid climates such as in the Philippine Islands, instructions were included in the orders of the guard to permit no one to sit on the bench, and a sign to the same effect was erected nearby.

After some days, the paint did dry, but the orders to the guard and the sign prohibiting sitting on the bench remained. Several years later, after construction of an electric rail system that provided transport through the tunnel for all -- and for reasons of no moment to this account, the guard post eliminated -- an inspired lieutenant (there is evidence that suggests he was a civilian reserve officer called to active duty) became interested in why the sign and the guard orders prohibited sitting on an object obviously designed for such a purpose. It may have been surmised already that his dogged pursuit of knowledge makes this story possible.

Now there is no intent in the foregoing tale to impute shortcomings to those who won just and undying fame in the heroic defense of Corregidor. Rather, it is to suggest pleasantly that by its very nature a military society nurtures the status quo and resists change.

In an era when conflict is a way of life, one of the agencies sorely pressed to cope with the changes demanded of it is the United States Air Force. In addition to the overwhelming demand for continuous adjustment to technical changes that is implicit in its primary mission, the Air Force has been required in less than a decade to adjust to two other changes, different in character, but each of substantial magnitude. First, it won its "fight" for independence and in 1947 became a Department. From a secondary, supporting arm of one service during an era when military affairs and civilian affairs of government were relatively discrete, it was suddenly "on its own" as a co-equal with the Army and Navy in an era when policy and power were no longer brothers, but Siamese twins. Then, before completing its first deep sigh of pride and uttering its first groan of responsible despair in this capacity, it was forced to assume an even greater responsibility: The role of the primary military arm.

Hence, there is logic in using the Air Force as a "laboratory" in which to examine the process of change. In a general, modest way this memorandum will attempt to do so. Specifically, it will direct attention to problems that are confronted in the utilization of social science research within a military setting, that of the United States Air Force. Its ultimate purpose is to draw from experience some hypotheses, or principles, that appear to underlie, or govern, the utilization process -- if not social change itself. To do this, there will be first, a discussion and analysis of four research projects (selected primarily for their illustrative characteristics) conducted under the aegis of the Human Resources Research Institute (the Air Force's social science research agency from 1949 until 1954, hereafter in this memorandum referred to as "HRRI," the short title by which many came to know it), and second, a discussion of some general aspects of the problem of utilization of social science research within a military setting.

Some Essential Background

It should be made clear that in the Air Force research is controlled to a large extent and in many aspects by individuals not trained in a scientific discipline. This is particularly true of social science research, especially during the planning and utilization phases. In this memorandum the generic term, "operator," selected because it is the term used by the military itself, will be used to refer to this representative of "management." He may come from one or more of the following functional areas: "policy", "plans", "command", "personnel management", "training", or from "operations" itself. In the social order of the Air Force he is supreme. He controls the "purse strings" and is promoted faster and in greater numbers than his research brother. In brief, he "runs the show."

He first enters the research process in the "requirements" phase, during which the question: "Does the Air Force need the research?" is theoretically answered. He has to state -- or agree in those cases in which the scientist himself suggests a research study -- that the Air Force requires the research proposed. Or, if the study has passed the early test of "being required," he can cancel it simply by eliminating the "requirement." Implicit in many instances is the demand placed on the "operator" to admit either that he or someone in the hierarchy is incapable of coping with the problem stimulating the research, or that some aspect of the system has been mismanaged and help is needed. Moreover, it is implicit that sponsorship or acceptance of a research project means that the "operator" understands the dimensions and nature of the problem researched -- or, where no definite problem is involved, the relation of the research to the Air Force's mission -- as well as the manner in which the research can be of assistance to him or the Air Force.

In the utilization phase, additional forces are present that work on the "operator." Now he is confronted with a need to change something: a procedure, a policy, an organization -- perhaps even eliminate all or part of his own function or area of responsibility. At this point the reluctance of an individual to change his behavior is accentuated and becomes as crucial to the social process as does the necessity for him to understand in the first place the problems and the relation of the research to the totality of the situation.

Example I. The Ethics Project

While bold and visionary in its approach to the solution of its new problems and responsibilities, the Air Force, like a person newly come to power and position, was sensitive about the manner of its performance. One manifestation of this concern is of interest to this account. Shortly after the close of World War II, some leaders of the Air Force became worried about the high incidence of dissident behavior among its officers and were led to the conclusion that a set of explicitly stated behavior standards, a "Code of Ethics," would lessen the degree of "bad" behavior.

The first attempt to develop such a standard, or code, was made within the Air Staff (the staff of the Chief of Staff of the Air Force). A board was created in 1947 and given the task of writing a Code of Ethics for Air Force officers. Several months of unproductive effort led to the delegation of responsibility for the task to the Commander of the Air University. This action led to the establishment of HRRI.

On the staff of the Commander of the Air University at that time were two colonels: X, a senior Chaplain within the Air Force, and Y, one of its outstanding combat commanders of World War II. While obtaining his doctorate, X had added understanding and appreciation of social science research methods to a professional and deep personal interest in the causes of human behavior. Y's intense combat leadership experience had convinced him that there was a pattern in the affairs of men, and that such affairs could be conducted better if it were known. They both deplored the guess work that often characterized the management of Air Force personnel.

The Ethics Project was assigned to them.

While exploring methods of undertaking the task assigned then, these two officers learned of the Committee on Human Resources of the newly created Research and Development Board of the Department of Defense. Under the broad guidance provided by this Committee, the Air Force was to have an integrated human resources research program; in fact, two agencies concerned primarily with psychological research -- the Human Resources Research Center ("HRRC") and the Human Resources Research Laboratory ("HRRL") -- already had been established. There remained a need for a social science research agency. Initial inquiries by X and Y concerning ways to evolve a Code of Ethics led to a broader question: Should the Air University fill this need? The answer was "yes"; consequently in June of 1949 HRRI was established at the Air University and given the mission of conducting research in these substantive areas of concern to the Air Force: Officer Personnel, Officer Education, Manpower, Human Relations, Psychological Warfare, and Strategic Intelligence Methods. Y became its first Director, and X the Director of the Ethics Project. The author was assigned to HRRI and the Ethics Project in August 1949.

Planning for the study was completed and data for the first phase collected shortly after the establishment of HRRI. The design of the study was as follows: Using Flanagan's Critical Incident Technique, a sample was obtained of approximately 1,000 incidents of "good" (ethical) and "bad" (unethical) behavior on the part of Air Force officers. These "cases," obtained from officers of the rank of major, lieutenant colonel, and colonel, were then subjected to qualitative analysis for the purpose of determining the ethical "themes" implicit in the judgments made by the officers providing the cases. The rationale was that "real life themes," as distinct from ones philosophically determined, were a logical step toward a Code of Ethics.

The Project staff was unanimously in accord that the implementation of the research results was as important as the research itself. Consequently, a great deal of planning and effort was devoted to the "utilization" phase. For example, numerous attempts were made at communicating interim findings to Air Force officers through lectures and seminars in various schools of the Air University. Such efforts had a feedback effect on the Project staff in that they contributed both to preparation of the Project report and to sharpening the insights of the staff during the final stages of the analysis phase. In addition, an explicit effort was made to inform all "operators" within the Air Staff (e.g., "Personnel" and "Training") who might affect the utilization of the research results and of the progress status of the project. Activities such as these brought the project to the attention of several key commanders of the Air Force. Among them was General Curtis E. Lemay, Commander of the Strategic Air Command, who considered the project to be of great potential worth in solving a major problem -- that of moral leadership -- in his command.

By early 1950 the analysis of the first-phase data was complete and steps were under way to obtain additional data to complete the project as originally planned. However, several factors entered the picture that affected the conduct of the study and the utilization of the research results. Late in 1949, a civilian had succeeded Y as Director of HRRI. After he had been on the job for a brief period, he voiced disapproval of the Project on the grounds that (a) it was not scientific enough, and (b) it was not possible to study "ethics" except in terms of the total "community." (The reader might note that the American Psychological Association used a study similar to the Ethics Project to evolve its own ethical standards.)

The specific effect of the new Director's position on the utilization phase of the project was to alter significantly the character of the Project Report. In fact, X was given to understand by the new Director that it would be the better part of wisdom on his part if "he would forget the whole thing," and that "in no case would an official report from HRRI be issued on the Project." However, X possessed an obstinate character when such was needed. He simply refused to permit over two years' work to be side-tracked. Widespread and profound interest in the study by the thousands of officers who had come to know it through his lectures and seminars fortified his desire to publish a record of the inquiry. As a compromise, 45 mimeographed copies of an "Interim Report" bearing no "official sanction" by HRRI was published. No "official" distribution of the report was ever made.

Thus, the Ethics Project was "concluded" short of its original goal: To create a Code of Ethics for Air Force officers. Yet it came close to attaining the essence of its purpose, if not the letter, for in June of 1950, the Chief of Chaplains of the Air Force arranged for a personal briefing on the study for his immediate superior, the Deputy Chief of Staff for Personnel, Headquarters, United States Air Force. The latter's response to the presentation is indicated by a comment he made in a discussion afterwards: "This is the most important work going on in the Air Force today." He followed this remark with instructions to prepare a program of moral leadership for the entire Air Force *to be implemented personally by its major commanders,* and to be based on the findings of the Ethics Project. To understand why this program was not undertaken one needs only to know the date on which the presentation occurred: 25 June 1950. The invasion of South Korea by the North Korean Army diverted the interest of Air Force leaders to more pressing problems!

But to understand fully the broader impact of the Ethics Project one has to take a brief journey to two events in later history. For the first, let us rejoin Colonel Y in the Fall of 1952, more than two years after he transferred from HRRI to General Lemay's Strategic Air Command (SAC). Now commander of an important SAC base in the middle west, Y is as enthusiastic as ever regarding the use of the social sciences in helping solve Air Force human problems. In fact, shortly after taking command of the base, he decided to do "something" about it. *His first effort was to apply* some of the ethical principles which grew out of the Ethics Project. But let him tell it (as he told the author):

> For over two years I've been trying to figure out just how in the world one could make any practical use of the ethical themes we used to talk about at HRRI. Well, when I first came to this base I decided to try. I noticed that the base c.o. before me had been the only one on the base with a paved driveway. I made it a point to get everyone out of the mud, and I stopped the practice of getting something special just because I was the c.o. Take the matter of the hack watches (Note: a special kind of watch worn by airmen). Not long after I arrived the supply officer came to me and said that a new shipment had come in. When did I want mine? As base c.o., I didn't need one. They are nice to have, save you some dough -- so he naturally thought that I'd want one. I asked him if he had checked with the tactical (combat) outfits. All of the watches finally went to them. Now what I had done was to recall the theme about the use of one's power position to one's own advantage. I was really surprised at the effect that even the simple application of that principle had!
>
> But the theme that had the most effect and was the most important was the one to do with keeping people informed -- letting them know where they stand and what their job is. I'm convinced now that most of our trouble in getting people to do their jobs lies in that one.

Note: Eleven ethical "themes" evolved from the Ethics Project. The two specific ones referred to by Colonel Y were:

> Foregoing personal advantage -- occupation, psychological, economic, etc. -- out of consideration for the rights of other persons or groups of persons.
>
> Seeking and sharing knowledge needful for the best performance of tasks; or a scientific attitude in dealing with problems or data, as opposed to arbitrariness, prejudice, rashness, or evasion.

To pursue further his sharp interest in and insight into the patterns of human behavior, Y instituted a management school at his base. To help him in this endeavor, he sought the assistance of HRRI. A team of social scientists was made available to help Y in his program. The "tangible" results of this work was a set of procedures for improving the operation of an SAC base while effecting a considerable reduction in personnel required for the task. Moreover, the study became well known and stimulated similar studies at other SAC bases. And while the intangible effects of this research, as in most cases, is difficult to measure, Colonel Y's comments are worth noting:

> While I felt that the manpower we saved in itself made the effort more than worthwhile, something else was at least as important. People worked better when they knew just what they were supposed to do and how it related to other people's responsibilities. In fact, I felt that I "had it made" when I started to get calls from wives to tell me that their husbands worked harder and were happier than they ever had been before.

The second stop of our journey through history occurs in 1952 also. The Ethics Project had come to the attention of the Commander of the United States Air Force in Europe (USAFE). As a result, he requested that a study be made of the standards of behavior of Air Force Personnel in the European area. This study was completed in the fall of 1952, but its usefulness was seriously impaired as a result of two errors of judgment by the staff of HRRI:

(1) Too great an insight into, and ability to use, the final report was attributed to the Air Force "operators" in Europe. This conclusion resulted in omission from the report of "suggestions for action," a major failure in this instance.

(2) An Air Force Chaplain should have been included on the research team. Failure to do so offended the Chief of Chaplains and his representatives in Europe.

Notwithstanding these serious shortcomings, the report made on this study was the basis for some worthwhile policy decisions in the United States Air Force in Europe.

Now what apparent principles of effective utilization can be derived from the Ethics Project? The first -- and perhaps most important -- is one that characterizes progress in any field of science: The products of scientific inquiry are often used for purposes other than those contained in the original goal of the inquiry; i.e., they may be applied to the solution of a different problem, or form the basis for further inquiry which in turn leads to new knowledge or ways of doing tasks simpler or better. The Ethics Project did not attain its goal of a Code of Ethics for Air Force officers; yet, its findings had a number of effective uses, only two of which are related in this account: Y applied them in operating a base of the Strategic Air Command, and the Commander of the United States Air Force in Europe used them as a basis for further exploration of a related practical problem. Elsewhere in the Air Force they were used as a basis for a course in leadership in the Air University, and as a "stepping-stone" to a manual on discipline for the Air Force.

Second, the Ethics Project illustrates the effect of a "negative" position on utilization that can occur in the military. A senior officer with wide experience in research once said to the author: "The single greatest problem in getting anything done is coping with the guy who says 'no'. Why, it takes the agreement of about 99 generals to get around one !!!!! major in the Pentagon who says 'no'." In the Ethics Project, the disapproval of the civilian Director seriously decreased the possibility of attaining the Project's initial goal. In the "Standards of Behavior" study in Europe, the negative position of the Chaplains affected detrimentally the utilization of the report of the study.

Third, the Ethics Project illustrates the principle that effective utilization of social science research will depend often (especially where pervasive or controversial changes are involved) on the addition of a force or influence on the part of persons not immediately identifiable with the social situation in which the change must occur. The presentation of the briefing to the Deputy Chief of Staff for Personnel on the Ethics Project Interim Report was arranged personally by the Chief of Chaplains of the Air Force. Had the Project staff made the arrangements, the briefing would not have occurred.

Other important principles of utilization are illustrated in the account of the Ethics Project. However, since they are more pointedly portrayed in the examples that follow, discussion of them will be included there rather than under this example. References to the Ethics Project will be made when appropriate.

Example II: The Air University Far East Research Group (Social Science Research in Combat)

If the Air Force fails in its primary mission -- that of deterring war -- then it must fulfill its secondary mission -- to be maximally effective when war occurs. Combat effectiveness of course is a function of the combination of machines and men. To study this relation, as well as to look into other aspects of the human elements in the war, HRRI sent a group of social scientists to Korea and other areas of the Far East in the fall of 1950. A unique opportunity existed in the substantive areas of psychological warfare research and strategic intelligence methods research, for in South Korea there existed for the first time a "laboratory" in which the "products" of sovietization could be studied firsthand.

Specific recommendations that HRRI study the human aspects of the Korean war came from a Planning Group of eminent social scientists who met at HRRI during the summer of 1950 for the purpose of outlining broad areas of research which they felt were appropriate guidelines for an Air Force social science research program. (The late Prof. S. A. Stouffer, who directed the morale studies conducted by the War Department during World War II, was Chairman of the Group. It is interesting to note that one segment of the report dealt with the subject of "research into methods of utilization of research.") Except for the utilization aspects of the study, the planning and execution of this project was essentially without fault. Endorsed by Headquarters, Air Force, its general terms and broad outlines were arranged for personally by General George Kenney, then Commander of the Air University, with General MacArthur and General George Stratemeyer, then Commander of the Far East Air Force (FEAF), the headquarters of the Air Force in the Pacific. Participation by HRRI's sister agencies, HRRC and HRRL, made it an integrated Air Force effort in the field of human resources research.

The group was comprised of 14 social scientists and two officers, of which the author was one. A majority of the group came from various universities and the remainder from the staffs of the permanent agencies. Meeting at HRRI some time before departing for the Far East, the group completed the planning originated by the in-service staffs of the HRRI, HRRC, and HRRL. Two "teams" were formed: A Personnel Research team of 10 scientists and one officer, and a Psychological Warfare Research Team of 4 scientists and one officer. Tentative methods of approach and design of interviews and questionnaires were completed. A name, "The Air University Far East Research Group," or "AUFERG" for short, was chosen.

The Personnel Team devoted its attention to such subjects as attitudes toward the war and toward Koreans, leadership, job satisfaction, and other human relations aspects of the war. It gathered its data in the form of structured interviews and questionnaires from five different combat units, 2 of which were in Korea, 2 in Japan, and one on Okinawa. Several thousand questionnaires and over one hundred and fifty intensive interviews were obtained. No analysis of the data was attempted in the Far East.

An account of the study conducted by a sub-team of a unit in Korea will illustrate the nature of the Personnel Research Team's task. The unit, a fighter Wing comprised of approximately 1800 men and 75 aircraft, was engaged in intensive combat operations at the time the sub-team arrived at its base. From the outset, the Wing Commander indicated that his regard for the study was not high. He "didn't see its purpose," and had his permission been sought, the study of the Wing surely would not have occurred. However, he did nothing to obstruct the research.

The two civilian scientists, (Dr. Floyd L. Ruch of the University of Southern California, and Mr. Dan Camp of HRRI), both superb practitioners of human relations, immersed themselves in the social climate of the Wing and established remarkable rapport in a very short time. The interviews were conducted and the questionnaires obtained, of course, during non-combat periods.

As the research progressed, certain marked changes occurred in the behavior pattern of the personnel of the Wing, as well as in the attitude of the Wing Commander toward the research team. The normal earmarks of a fighter-type unit -- which might be described by the phrase, "boisterous exuberance" -- became less noticeable. Instead, a conservative climate became normal. The Wing Commander became friendly and approachable in contrast to the distant attitude he had displayed initially. And prior to the sub-teams' departure from the base, he sought out the author and voluntarily provided the following comment:

> Frankly, I think you know how I felt about you people when you first got here. I just didn't like it. But since you've been here I've noticed quite a change in the Wing. Haven't you noticed the extraordinarily reserved atmosphere at the Club?? I'm still not clear as to what you intend to do with the information you've gotten out of us, but I will say this: Whatever your trip cost the Air Force, it was worth it just from the good you did in my Wing alone.

Perhaps the Wing Commander was prescient, for after the return of the Group to the U.S., it became clear that insufficient thought had been devoted to the analysis of the data of the reports pertaining to the work of the Personnel Research Team. Months passed before a single report was published, and many of the reports originally intended for publication never reached that stage.

By comparison, the Psychological Warfare Research Team was a model both of how to carry out research in an overseas theater and of effective utilization. Despite the bitter Korean winter and amidst the confusion of a badly confused war, the Research Team not only completed its data-gathering, but coded it, transposed it to IBM cards, and completed a partial analysis while still in Korea. (Note: If the reader wonders about the availability of IBM equipment in Korea at this particular time, he may be consoled by the knowledge that so did the author.) Within four weeks after the return of the Team to the U.S., its report was completed, and within two months, printed and distributed. But of more importance, those who could use the report were kept apprised of its nature with the result that it was used widely.

As a result of the work of the original AUFERG, and in light of the broad social science mission assigned it, HRRI decided to establish a permanent detachment in the Far East. This action was taken with the personal knowledge and approval of the Vice Commander of FEAF, Maj. Gen. (later Lt. Gen.) L. E. Craigie. The Rand Corporation agreed to provide one scientist to work in cooperation with the permanent AUFERG.

One of its first projects was a morale study of Chinese and Korean prisoners of war. By the time of the Korean Armistice negotiations, the analysis phase of the project had advanced sufficiently to permit an interpretation by the Rand representative, Dr. Herbert Goldhammer (who had provided major guidance of the research). His conclusions had such import that they were brought to the attention of the truce team. By then, Gen. Craigie had become the first Air Force member of the truce team. His knowledge of AUFERG's work prompted him to invite Dr. Goldhammer to visit Panmunjom, where he remained for over four months as a major advisor to the team.

What principles can be derived from the experience with AUFERG? First, it demonstrates that effective utilization of social science research depends to a large degree on planning for such utilization at the same time that plans are made for the research itself. Little or no attention was paid by HRRI planners to the subject of utilization of the research findings of the Personnel Research Team. Primarily for this reason, the results were not forthcoming in time to be of real use. It would have been far wiser to have sacrificed a degree or two of sophistication in the analysis and conducted enough of it in the Far East to have permitted a preliminary report to be submitted to the FEAF. As things turned out, such a preliminary report would have been of substantial benefit to FEAF in solving some of the difficult personnel problems it had at the time. Conversely, because utilization was planned for, the findings of the Psychological Warfare Research Team were produced and distributed with dispatch. As a result their usefulness was greatly enhanced.

Another principle of utilization (and one closely related to the preceding one) is that effective utilization must take into account the dynamic, changing nature of social situations. Again, this principle may seem so obvious as to not warrant mentioning; however, in altogether too many instances researchers have foreclosed on the possibility of effective utilization of their efforts by attempting overrefined analysis. Failure by HRRI to recognize this principle was a major factor in the ineffective utilization of the findings of the Personnel Research Team. On the other hand, the permanent AUFERG later conducted a project that exemplified the positive side of this principle. Called "Project Symbol," it was a study of ways of communicating with Chinese and Korean soldiers. The officer who was at that time Chief of the Psychological Warfare Division in General MacArthur's headquarters said this to the author: "Symbol is the project I always think of when I need an example of social research being finished in time for it to be of some real use."

Effective utilization must recognize that a research endeavor tends to affect the very situation which it has under study: this is the third principle illustrated by this project. The members of the fighter Wing knew that it was being observed by scientists; this knowledge affected their behavior. The change in the Wing's behavior impressed the Wing Commander, whose attitude toward the research was affected. (This principle was also demonstrated in the Ethics Project. At one point, an attempt was made to solicit the attitudes of a large class of approximately 500 officers ranking from major to colonel toward the meaning of the ethical themes. The school authorities had limited the time of the Project staff to one afternoon. However, the reaction of the group to the experience was so strong that the authorities altered their original position and granted additional time of substantial proportions.)

The final principle illustrated by this Project is that effective utilization usually will depend on an operator possessing insight into, and knowledge of, how the social sciences can be utilized in solving problems of policy and management. Gen. Craigie possessed a profound understanding in this respect which provided the basis for his agreeing to the establishment of a permanent AUFERG and for inviting Dr. Goldhammer to visit Panmunjon.

Example III: Project Repair (A Study of Repatriated Prisoners of War)

As early as 18 months prior to the return of the first U.S. prisoners of war which resulted from the end of fighting in Korea and subsequent negotiations, HRRI attempted to establish a research project designed to reveal the character and nature of a problem that later was to assume large dimensions. It was felt that prisoners who had been subjected to intensive Communistic propaganda and brain-washing presented a problem, the solution of which could be helped by social science research, and that to be maximally effective, research should begin at the time the prisoners were first liberated. However, the effort to establish a requirement for such research was not successful.

As a result, it was not until the fall of 1953 that the POW problem was perceived by the Air Staff as having aspects in which social science research could be of some help. Even then, the requirement that led to HRRI's participation emanated primarily from the understanding of the potential contributions of social science to the solution of the problem by the Commander of the Air University at that time, Lt. Gen. (now General and Commander of the North American Defense Command) Lawrence Kuter, rather than from the formal organizational entity of the Air Force responsible for determination of requirements. In fact, the Air Staff apparently perceived the problem successively from four aspects prior to the initiation of any research: first, as a psychological warfare problem (i.e., what would be its effect on public opinion); then as a problem of medical rehabilitation of the returned

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prisoners; next, as a security problem; and finally, as a punitive problem (who should be punished, what should the punishment be, what should it cost). At the latter point, HRRI began its research.

An interdisciplinary team of psychologists, psychiatrists, sociologists, anthropologists, and statisticians conducted the research. Data were obtained from a number of sources, including a vast body of written material obtained by agencies other than the project staff (such as Intelligence interviews), psychiatric interviews with a number of the prisoners, and a comparative study of historical and legal information. From the operator point of view, the research was to provide suggestions on these aspects of the problem:

1. Punitive
2. Policy
3. Training

Completed in the fall of 1954, the report on REPAIR (together with a number of periodical briefings by members of the project staff for the policy board established at the Air Staff level to deal with the problem) was a major influence in the formulation of Air Force policy governing treatment of returned prisoners of war. The difference among the services with regard to this problem is well known, as is the profound, pervasive importance of the problem to the nation as a whole. The soundness of the Air Force position, of course, must await the test of history. By and large, however, it has received favorable comment from the nation's press; this is not true of the position of the other services.

What principles of effective utilization can we observe in this project? Project REPAIR, both from a research as well as the utilization point of view, was one of HRRI's finest hours. It was conceived by a senior ranking general officer of the Air Force (one who has a singularly broad understanding of the political and social responsibilities of the Air Force), and the utilization process was considered an integral part of planning for, and conduct of, the research study itself. Explicit effort was made to tell each operator concerned with the ultimate policy formulation how the work was progressing -- in his language. In fact, whatever success the project had was due in large measure to the effective performance of two key operators on the Air Staff, one who had been in HRRI before his assignment to the Pentagon and the other a social scientist turned operator.

Principles discussed previously will be recognized readily by the reader: Effective utilization depends on planning for it along with the research; it depends on operators having an insight into the problem; and on having it ready when it is still applicable to the situation. But the really important ingredient is that utilization was conceived as being important and was worked on continuously and with the expenditure of large amounts of time and effort.

Example IV: The "Working Model" of the Soviet Social System

In the summer of 1950, HRRI initiated its largest and most important project: An Analysis of the Soviet Social System. The project was carried out entirely by contract with the Russian Research Center of Harvard University, the late Prof. Clyde Kluckhohn, Director. Since a final report of the project is to be published in the near future, only a brief explanation will be provided in this memorandum. The project consisted of the analysis of a large body of data in the form of interviews, questionnaires, and clinical tests gathered in Europe during 1950-51 from Russian émigrés. The objective of the study was to formulate a set of descriptive principles about the Soviet system from which depictions could be made about how it would react to a given set of conditions. Original written material about the project described this set of principles as a working model.

While the analysis of the data was underway in the summer of 1953, the project was brought under attack in the Congress. Senate interest in it was stimulated by lack of understanding as to how one would make a model of such a thing as a social system. It should be noted that both HRRI and the Russian Research Center had earlier recognized that the use of the term working model was likely to create misunderstanding in the minds of operators, but the budget cycle being as it is, there was no chance to remove this term from the materials included in earlier budget presentations.

As a result of the inquiry by Congress, tremendous pressures were brought to bear within the Air Force to cancel the project. Only the intervention by individuals high in the government prevented the project from being abandoned. (It should be noted that much if not all of the congressional criticism could have been avoided had there been a representative of the Air Force present at the hearings who was knowledgeable of its responsibilities as a social and psychological factor in the conduct of national affairs.)

While this project illustrates a number of principles of effective utilization (e.g., that sometimes effective utilization will depend on the intervention of someone not immediately identifiable with the situation), the project best illustrates perhaps the most important of all the principles of utilization: That effective utilization depends on the manner in which the research results are portrayed with symbols understandable to the operator.

From a practical point of view, communication between the scientist and the operator is the most difficult aspect of the utilization of social science research. The difficulties resulting from the use of the term, working model, epitomizes the troubles that can result from failure to consider the importance of this principle. To take another example of this important principle, let us go back to the Ethics Project. The use of the word "ethics" was a source of great difficulty, for it has almost as many meanings as there are people who use it. This meant that the project staff often received arguments instead of responses.

Still another illustration of this principle is contained in the following account: The author recalls a conversation with Gen. Robert McClure, onetime chief of the Army's Psychological Warfare Division, shortly after he had finished wading through a lengthy and difficult research report (of an agency other than HRRI in this case!). General McClure's comments were something like this: "You'd think that all of you hot-shots in the field of understanding human beings would have better sense than to turn out a product like that. I've had to put 10 men on it for a month to put it in a shape that we can use. Why can't you do that in the first place?"

Some General Comments on the Utilization of Social Science Research

My experience would seem to indicate that many aspects of the utilization problem are missed, overlooked, or incorrectly appraised by scientist and operator alike. First, and transcending all other aspects in importance, is that in the social sciences, utilization of research is inseparable from the conduct of the research itself. To say this another way, utilization must begin when the research begins and must continue throughout the life of the research, and even far beyond in many instances. It cannot be taken for granted, or treated passively. It must be supported adequately. It does little good, for example, to spend $250,000 on a research project only to have publication of the results prevented by lack of $10,000.

In the second place, effective utilization will always depend on recognition of the total situation that can affect, or can be affected by, the results of the research. This would appear at first glance to be so fundamental as hardly to warrant comment. However, many fine research studies have been allowed to gather dust through failure to understand their importance. All too often the scientist or operator fails to take into account the relation to the total situation that characterizes the particular segment which is the focus of a specific study. For example, the research results of an outstanding study sponsored by HRRI and directed toward improving the career management of Air Force officers was vitiated through failure by HRRI to recognize the necessity for including in the planning phase of the study the key member of the Air Staff who was responsible for Career Management at that level.

Third, and closely related to the preceding item, effective utilization of social science research which is designed to aid top policy-makers must take into consideration the unitary nature of the total process of national security preparation. The scientist or operator responsible for social management aspects of the top echelons of the Air Force must consider these two things: One, the strong interrelationships among the major functions (e.g., between policy and logistics, and budget and personnel) involved in managing the Air Force itself, and two, the even stronger relations between the total Air Force mission and other major functions of national security preparation. For example, a research study of Korean and Chinese prisoners of war should have been explicitly and intentionally related to truce negotiations rather than have occurred fortuitously.

Fourth, effective utilization of social science research is often handicapped by the operator's failure to understand its nature, which in turn stems from an implicit comparison of the measuring devices of the physical sciences to those used by the social sciences. This comparison is usually a matter of first (and fallaciously) attributing to the physical sciences the ability to measure with absolute precision, followed by a comment such as this: "Since the social sciences can't do the same, they really aren't sciences." Experience indicates that an explanation of this fallacious reasoning often erases an operator's doubt or misgivings about the worth of social science research.

A fifth and vital aspect of utilization often overlooked is that it seldom works on a "shot-in-the-arm" principle. Rather, in most instances positive and continued effort must be exerted to accomplish the changes that research would indicate. There is a need to understand that a decision by a policy-maker seldom if ever in itself accomplishes a change. Between the decision and the change there is a time interval and a need for overt effort to make the utilization effective.

Sixth, until a time comes when there are professional social engineers to implement the products of social science research, the best avenue to effective utilization in the Air Force will be through use of officers as quasi-social engineers rather than the use of trained social science research personnel for such a purpose. This, of course, is a matter of relative emphasis -- both should be used if necessary. Two factors lead to this conclusion: One, it simply takes less time and effort to provide an officer with the necessary skills and insights to be an effective social engineer than it does to educate a competent scientist and then indoctrinate him with the complexities of the Air Force; and two, the symbols important to effective utilization favor the officer -- i.e., he's already a member of the "in" group.

Finally, there is a need for comment on the importance of the utilization process. Both as a member of HRRI and later as a student and faculty member of a senior, joint-service school (the Industrial College of the Armed Forces), I was privileged to witness the formation of policy at high levels of government, both in and out of the Air Force. As a result, I became convinced of the truth of the statement made easily today: That the most important problems of the nation -- if not mankind -- are those the solution of which (if one is to be found at all) lies in the social sciences. Too often, however, social science research falls short of making real contributions simply because the utilization phase is not given adequate attention, particularly by the researcher. For some time to come, the latter must assume at least partial responsibility for the utilization of research results, if for no other reason than that if he doesn't no one else will! For those who may be offended by this thought, there is offered the counsel that even physical scientists have come to realize some responsibility for their efforts.

RESEARCH UTILIZATION

By Howard E. Page

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I. THE PROBLEM

If one traces the history of research through the past 25 years some rather startling statistics are found. In 1929, expenditures for research in this country amounted to $160 million. This included industrial research, military research, university research, medical research, agricultural research, and all the physical and biological sciences.

World War II was well along before the dollar volume of research doubled the 1929 rate. As late as 1940 total U. S. research accounted for the expenditure of only $345 million per year. The end of the War saw this figure increased to $1.3 billion per year, and last year total research expenditures amounted to $3.75 billion, or 1.25 per cent of our gross national product.* Clearly research has become a new force of significance in our national economy!

If research is to be productive it must be economical; it must utilize to the maximum the creative capacity of its researchers and the probability of success must be great.

Success means different things to different men. To the researcher himself the completion of his research task means success. It is gratifying if he is able to substantiate his hypotheses, although negative knowledge is equally important to the scientist. He is happy if at the conclusion of this research he has added a bit to our store of knowledge, if a "well done" is received from his peers and if his article is accepted by an editor of the scientific journal of his choice.

To the Research Administrator success may mean quite a different thing. He judges success in terms of his ability to get a competent man working on a problem important to the organization he represents. If the time schedule is met, if the work is performed within budget limitations, and if a final report is prepared which is intelligible, well-packaged and distributed to appropriate individuals, his life is that much easier and the research is deemed successful.

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*Above statistics taken from "Trends in Industrial Research" by Clyde Williams of the Battelle Memorial Institute, Columbus 1, Ohio.

To the industrialist and to many agencies in the Department of Defense and other government organizations research success is measured in more immediate ways. Is a new product now available for manufacture and sale? Are new techniques available as a result of the research either for development of new products, new weapons, and weapon systems? Here the criterion of success is the immediate utilizability of the research findings in moving forward to outdistance a competitor, make money for stockholders, or win a war.

How research gets utilized is the problem before us. It is easy to cite examples of research that have been used and probably even easier to cite instances where nothing has come of the research. It is the process through which this utilization comes about that concerns many who are involved in one way or the other in the support of research programs. And it is this very process which is so difficult to document and to understand. Many have passed it off by stating that any useful knowledge will find a user. Others state the problem only in terms of communication. Still others mention only the timing as a factor in application of research.

All these are obviously factors in the utilization of research findings. But the problem is more complicated than these would indicate. It is doubtful if any listing of contributing factors can ever be complete. Rather than attempt such a list it may be possible to describe a specific case in point and see what conclusions can be drawn. This is attempted in the next section. Following that an effort will be made to indicate some of the forces at work which make the process of research utilization a complicated one.

II. THE CASE OF "PRI FLY"

The following is an attempt to document activities involved in the effort to get new research started on an important operational problem. It is unusual in that the problem here is not so much the utilization of research findings as it is to get new research started. The recognition of needs for such research, however, was the result of research and in this sense the problem is still that of application.

Since the purpose is to offer leads as to problems in utilization and since it might impair relationships with individuals (if not actually violate confidences), names of individuals have been omitted. Even with this precaution the information may imply criticism, confusion and disorganization to the extent that it cannot be used in any manner other than a jumping off point for a discussion of critical aspects involved in the problems of utilizing the researcher and his research.

9 Dec 1953	_________ submitted a proposal to study "Carrier Flight Deck Operations and Communications under High Intensity Noise Levels."
17 Dec 1953	439 circulates proposal to BuAer, BuMed, and CNO asking for comments from BuAer and CNO and for 50% support from BuMed. BuMed declines to support -- replies from other recipients not available.

Jan 1954	It was decided within the __________ __________ Division that this proposal, revised appropriately, could be used as a means of "buying program guidance" and would serve to get at real problems from the Fleet. The latter was felt to be necessary because almost all the "personnel" psychological research was being done at Pensacola and this was centered around aviation training problems.
Feb 1954	__________ was called in to a conference with 450, 439, 458 and possibly others and the "survey of psychological problems" approach suggested to him. It was emphasized that __________ was to conduct the survey himself and not delegate the work to a subordinate. It was also decided to tie the survey to the vehicles of command communications, high intensity noise, and the catapult crew.
6 Feb 1954	__________ submitted a revised proposal in line with the conference suggestions.
11 Feb 1954	458 PJ's above using FY 54 (R) funds available and a contract is negotiated.
19 Mar 1954	Letter prepared for 400 signature to BuMed requesting that __________ be appointed BuMed liaison officer to accompany __________ on his first carrier trip. Letter requested verbally by BuMed to serve as basis for authorizing __________ trip on the __________.
24 Mar 1954	BuMed concurs with above and __________ is appointed.
26 Mar 1954	Letter prepared for 100 signature to CINCLANTFLT via CNO requesting permission for __________ (3-4 weeks) and __________ (3-5 days) to go aboard the __________.
20 May 1954	__________ presents the results of his cruises to date to 439, 454, 458, _________, _________, _________ and __________. Discussed the communications problem of the catapult crew but spent most of the time on human engineering problems. This is where PriFly was introduced for the first time. __________ was encouraged to submit a separate PriFly proposal at this time; to continue the rest of the survey on a Mediterranean cruise accompanied by __________; and to de-emphasize the high intensity noise aspects of the study. It may have been at this meeting that CAPT _________ suggested that _________ meet with some BuShips people to explain the problem to them.
9 Jun 1954	_________ wrote a memo to 439 describing a meeting that 439 had set up for him with CAPT _________, CAPT _________, Mr. _________ and Mr. _________ (Civilians from BuShips), CDR _________ from BuShips and a LCDR from BuAer.

	________ apparently discussed his first (7 June) PriFly proposal and was encouraged with the response to it.
11 Jun 1954	454 memo to 439 criticizes ________ first PriFly proposal on the basis that the phases outlined should be rearranged in a better temporal sequence.
16 Jun 1954	439 prepared letter for 400 signature to BuAer (S1-1) and BuShips (Code 312) forwarding the PriFly proposal with 454's suggestions for rearrangement of phases and asking the Bureaus' opinion and extent of possible support.
21 Jun 1954	Copies of ________ PriFly proposal arrive in 450 via INSMAT, Philadelphia. Assigned to 458 at this time.
24 Jun 1954	BuAer (________) responds to ONR (439-400) letter indicating the Bureaus' interest in the problem and that they would support 50% of the cost from FY 55 funds.
Jul 1954	439 transmits file of correspondence to 458 indicating that BuShips had not yet responded to the 400 letter of 16 June and asking 458 to "take it from here."
19 Jul 1954	458 prepares a letter for 400 signature to BuAer (S1-1) requesting that the funds allotted to the PriFly project be transferred to ONR.
10 Aug 1954	BuShips (________) answers the ONR request for comment and possible support of PriFly. The request for support was turned down on the basis that BuShips had discontinued outside contracts for Human Engineering work -- "... the Navy is adequately staffed by competent officers and civilian personnel who are able to resolve basic operational needs."
30 Aug 1954	439 writes to ________ bringing him up to date on the status of PriFly; i.e., BuAer is willing to support it, BuShips was not. Suggested that ________ ready himself for a high-level presentation to CNO's Ship Characteristics Board on the whole carrier study with a few pertinent remarks on PriFly. If this group is sufficiently impressed it was felt that the Bureaus would be told to increase their interest in this type of research.
2 Sep 1954	454H writes to Mr. ________, BuShips Code 318 indicating that the PriFly matter apparently could not be undertaken as a jointly supported project as originally planned and outlining the procedures the addressee could use to get in-service human engineering on the navigation console of the ________.
30 Sep 1954	________ of CID writes to 439 indicating his availability for presentation by ________ in 439's office on 4 October 1954.

10 Nov 1954	_________ writes 439 describing the designs for PriFly for the _________ which he had visited at Newport. Still many fundamental human engineering errors.
6 Jan 1955	_________ presents his findings of the carrier study to 439, 450, 454, 452, 454H, 458 and CDR _________. No mention of PriFly in 458 notes on this meeting. It involved a discussion of the findings, the report, and the distribution. 450 suggested at this meeting that _________ should not be called upon to "sell" his research problems (those revealed in the study) in the Bureaus unless he was in the capacity of a paid ONR consultant. At this meeting 439 and _________ suggested revising the report -- it was "too caustic." 458 supported by 454 and 450, fought the revisions -- said it was _________ responsibility to report what he saw.
Jan 1955	_________ report, "Functional Research on Aircraft Carriers," given limited distribution to carefully selected individuals. Many of the copies were accompanied by letters of transmittal signed by ADM _________ or CAPT ______. There is a file of replies available -- most are favorable comments on the research.
8 Apr 1955	_________ presents his study to ADM _________ staff in CNO. Op 10, 33, 34, 50, 53, and 55 were represented. _________ was introduced by CAPT _________. He has seen some of the participants individually since. PriFly, catapult teams, and team replacement were presented. The motive was to get acceptance on the replacement problem. PriFly was incidental and not the purpose of the meeting. Instigated by 458. At this meeting, CDR _________ (461) mentioned their interest in PriFly and that he was going to try to get support for it.
18 May 1955	CDR _________, at the Navy Advisory Committee on Human Engineering, blasts the PriFly proposal and said there were more immediate problems to which BuShips would prefer to direct its funds.
June 1955	LT _________, _________, and CDR _________ of the Air Branch met with CDR _________ of BuAer to try to get BuAer's 35M back. This, it appears, was never sent to ONR but a stop order was issued on it when BuAer got wind of BuShips attitude towards the PriFly study. CDR _________ attitude was less than enthusiastic but thought that the money could be raised.
June 1955	CDR _________ (461) met with CDR _________, CDR _________ replacement in BuShips. He attempted to re-interest BuShips in the _________ proposal. Although CDR _________ was agreeable, higher echelons in BuShips still vetoed the idea.

Oct 1955	Code 200 through undisclosed means gets hold of the ________ proposal and gets interested in it. They are responsible for bringing 900 into the picture.
1 Nov 1955	455, 458, 200, and ________ (now ONR 900, formerly BuShips 318) met to decide how to go about implementing PriFly studies. It was decided to approach BuAer and BuShips with a proposition for a long-range human engineering program similar in plan to the ________ program with immediate, interim, and long range phases. A letter for the ADM's signature was drafted and circulated among Codes 900, 439, 450, 458, 461, 460, 469, 463, 200, and 101. This was returned with the suggestion that Op 55 be informed of the plans.
16 Feb 1956	455 talked with BuAer (S.1.6) in connection with a redraft of the Admiral's letter based on earlier recommendations. Told by S.1.6 that problem had been placed with an In-Service Lab to make study of PriFly. They felt a program as proposed by letter no longer needed. If letter could be rephrased to set up study of overall air operations they would enthusiastically support.
17 Feb 1956	Letter was rewritten by 455 and again discussed with BuAer (S.1.6). CAPT ________ (Op 552) contacted and content of letter discussed. Enthusiastic about idea.
29 Feb 1956	Saw CDR ________, BuShips, who has Carrier Desk and discussed contents. Was enthusiastic.
5 Mar 1956	Letter prepared to go to CNO, BuShips and BuAer suggesting if they concurred in plan they assign representatives to meet with ONR to study ways of implementation.

III. FACTORS IN UTILIZATION

The history of the PriFly proposal is difficult to follow and even now almost impossible to document. There seem to be several reasons for this. Several changes in cognizance within ONR -- even within the Psychological Sciences Division -- were brought about for reasons which appeared pertinent at the time but which in retrospect may have merely added to the difficulties. The principal investigator having had long contact with the Navy did much in the way of direct and personal contact which now makes it difficult to be certain of all the facts. The original proposal was in fact an informal one presented outside the usual channels.

In studying the case of PriFly, however, many gaps exist in its history, and numerous factors strike one that had obvious influence on what was accomplished or what failed. One can see problems of organization and structure, responsibility and cognizance, coordination and communication, vested interests, the role of the research administrator, policy formulation and factors of basic vs. applied and operational research as all playing a part in the failure to get new needed research under way.

a. Organization and structure

The Navy is organized into seven major Bureaus and the Office of Naval Research, each with a different and extremely generalized mission. As far as research is concerned, ONR's role is to coordinate research and development among these agencies. This is a tremendous task. In the case of PriFly - BuMed, BuAer, CNO, and BuShips were all involved outside of ONR. There was a basis for involving each, and final concurrence from each was required before much could have been accomplished. This, as you have seen, has not been forthcoming to date.

b. Responsibility and cognizance

It should be quite apparent that here again there is no clear pattern of organization which makes for easy coordination. BuShips is responsible for the ship itself and the equipment installed thereon. BuAer is responsible for the operations of flight squadrons aboard the carriers and thus uses much of the equipment for launching and recovery of planes. The Ships Characteristics Board (a CNO Agency) makes final decisions as to where equipment goes, etc. but even here individual shipyards are free in their interpretation of specifications and it is difficult to find two ships alike.

Even within the Office of Naval Research lines are not completely drawn as to division of responsibility and cognizance. The Psychological Sciences Division has interests in human engineering of the type proposed in PriFly. Also, there exists an Air Branch, an Operational Research Division, a Development Coordination Division, all of whom may have an interest. Within the Psychological Sciences Division itself the PriFly Problem has interest to Physiological Psychology, Personnel and Training, Human Engineering, and even to an extent to the Social Psychology program itself.

c. Coordination and communication

The difficulties of coordination and communication become quite apparent in light of the discussions above. If the Engineering Psychology Branch had been in existence in 1953, it might have been possible to centralize the communication and coordinating activity to an extent that would have led to greater progress. This is not at all certain, however. With the large number of Bureaus, desks and individuals involved, it is a tremendous task. An analysis of the case of PriFly indicates that over a period of more than 2 years communications and discussions were held with better than 50 individuals, offices, agencies, etc. This factor, coupled with the continued change in personnel as a result of the Navy's rotation system for military personnel, merely re-enforces one's ideas of the magnitude of the problem.

d. Vested interests

Where such diversity of organization and responsibility exists, it is obvious that vested interests play a role in any effort to undertake new approaches to problems. ONR certainly had such interests in its desire to see the investigation of such a problem undertaken. This is clear in the January 1954 action where ONR's need for guidance on real Fleet problems is recognized. The civilian scientist's interests are also quite apparent in his effort to move on to problems related specifically to Human Engineering whereas the original survey was aimed at the total problem of Carrier Flight desk operations and communications. These interests were subsequently furthered in no small measure by the principal investigator's personal contacts with both operational and research persons in an effort to gain support for his proposed studies on Human Engineering.

The August 1954 action on the part of BuShips, refusing to support BuAer in underwriting the study and indicating the adequacy of the Navy to solve its problem "in-service," clearly is not wholly based on fact. Again, the May 18, 1955 meeting at which BuShips took exception to the problem and indicated higher priority problems directly relates to the question of individual interest.

e. The research administrator

What success means to the research administrator has been touched on early in this discussion. He needs guidance as to important Fleet problems if he is to support a research program meaningful to the Navy. In this instance he probably too readily perceived that his needs might be met by the original survey proposed and undertaken.

At the completion of the initial survey, he had several choices available. He could have held out for an extensive overall research program aimed at the total problem area just surveyed. This would obviously have called for extensive coordination, delay, large amounts of funds, etc. He took the alternative and supported an effort to tackle a specific problem of interest to the principal investigator believing that concrete research on a specific problem would be easier to finance, to support with interest from other agencies, to show results of benefit to the Navy. Either approach might have worked. The one selected has failed to date.

The problem of financing such research always concerns the research administrator. It is always easier to support small projects. It is the hope of the administrator that success on a specific problem will make funds more readily available to undertake the larger effort. It is also possible that if funds are provided by operating agencies they have a greater stake in the research, and utilization of findings is thereby more easily brought about. Incidentally, this is only a hypothesis (frequently accepted as fact) which might be tested. While ONR might have financed the total effort and might have actually undertaken the research without active support of the Bureaus (concurrence in this type of research is essential), it was these latter considerations which led to the procedures actually followed.

f. Policy making and the application of research

One often hears the question, "Why are scientists so often unwilling to see the practical side of problems?" Frequently, also, one hears the scientist ask, "Why do we keep doing things this way? Our research has proven it to be wrong and better ways are available." Such remarks raise the whole question of the relation of the scientist and his research to policy- and decision-making.

The practical side of problems involves policy decisions in the domain of economics, social affairs, organization, and even in the legal realm. Scientists have no greater claim to competencies in these areas than others and frequently introduce their own prejudices and over-simplified notions when forced to suggest courses of action.

The type of decision- and policy-making frequently employed in utilizing research results involves action on the basis of incomplete information. In general, scientists will not consider a topic ready for scientific discussion unless the area of incomplete information has been ascertained. Policy-makers may have to make decisions no matter how little they know about what they do not know.

From this point of view it may be argued that the scientist has little role to play in decisions as to the utilization of his results. He might better devote his efforts to increasing the information available to the decision-maker and packaging this information in a manner which is understandable and useful to the operationally oriented user.

This places a terrific responsibility on both the researcher and the user. The user must be able to define better than he frequently does just what information is needed. It may well be that too much information is sometimes available and that the decision-making problem is that of what to use rather than insufficient data.

The researcher has the great problem of communicating his results in a manner useful to and understandable to the operator. The engineer plays his role for the Mathematical and Physical Sciences and has become a respected professional (sometimes confused, I fear, with the scientist). The Human Engineer might have conceived a similar role for the interpretation of the Social and Biological Sciences. This he has failed to do in so narrowly defining his role as to be concerned only with human aspects of equipment design. Perhaps a new profession -- a Social Engineer -- is the immediate need. Such a person would play the role of translator of Social Sciences research. Some Economists now play this role. Such a person would undoubtedly do much to augment the utilization of research findings in such areas. There is a great lack of personnel competent to translate research results into practice. This appears to be a problem for both universities and the military departments.

g. Basic versus applied and operational research

Much has been said pro and con concerning the usefulness of basic versus applied research. The major difference appears to me to be in the basic motivations of the researcher. The dichotomy appears to be whether the research is directed toward answering a specific problem or directed toward increasing general knowledge.

Many of the problems facing the Services today cannot be answered by direct translation of the basic research data available. For example, despite the many years of study of vision and the visual process, there is little or no data which can be applied to the problem of empty-field myopia as experienced by pilots at high altitude. In the main, visual and auditory problems in the Fleet cannot be attacked with absolute threshold data. They require answers to specific visual and auditory tasks where only relative thresholds have meaning.

On the other hand, considerable basic data have been applicable to operational problems. For example, the basic work on dark adaptation and red light led to the use of red goggles in the ready room, and the work done by Gibson on 3-dimensional visual cues has become the basis for a whole new approach for presenting information to the pilot.

In-service laboratories in general undertake research arising from an operational need although in most cases some research is generated from individual interests in conducting research more basic in nature. This seems right to me from the point of view of utilization. The research on operational problems gets used while much of the more basic research in such laboratories is undertaken because the need is recognized as a result of the intimate contact with operational needs.

The problem remains in insuring that in-service laboratories are kept abreast of basic research of interest to them. This is essentially a problem of communication and is handled in the traditional manner of distribution of reports, stimulating publication in technical and professional journals, conferences, symposia and the like. The problem is complicated by turnover in personnel but enlightened administration can do much to overcome this. A recent example is the use of the staff memorandum to call attention of all recently assigned officers to a list of relevant research reports available and urging them to become acquainted with their contents.

IV. WHAT MIGHT HAVE BEEN

Hindsight is always better than foresight. The procedure actually followed in attempting to get research undertaken on the Human Engineering aspects of carrier flight control might have worked. It may still work. The scope of the problem was such that it could have been financed. Outcomes would have been clearly related to Navy needs and would have resulted in specific recommendations, some of which could have been readily implemented. New problems would have been uncovered, and the adequacy with which the research was completed would have made likely other research, more easily supported and utilized.

The alternative of moving slowly toward implementing the research proposed in regard to the total carrier problem appears the better one after 2 years of effort. This is exactly where we stand today. The November 1, 1955 action to approach the Navy at large with a proposal for long range research on Primary Flight Control with immediate, interim and long range phases is underway. At least some of the Bureaus have already named representatives to meet with ONR and study ways of implementing such a program.

We might have started here 2 years ago -- where we would be today if we had is anybody's guess. My guess is that we would have been closer to our goal than we are today.